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VOL.2 NO.4

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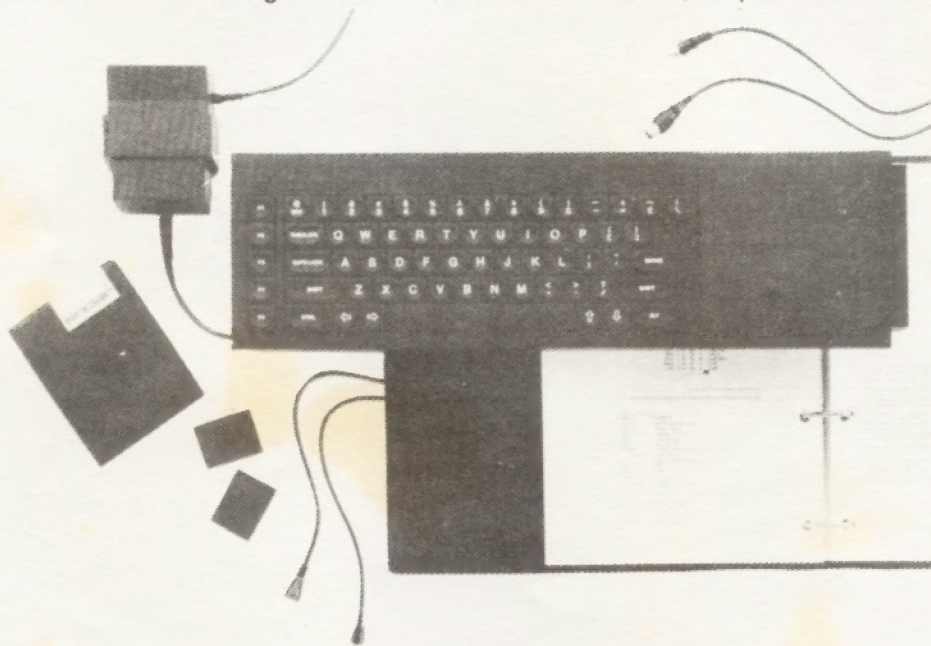
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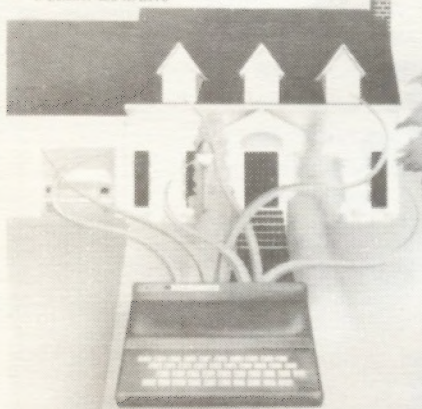
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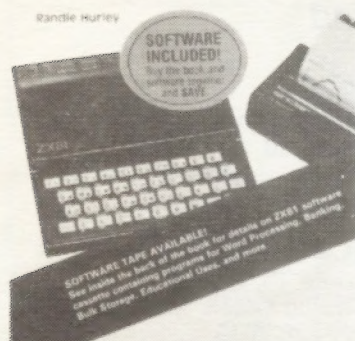
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MAGAZINE

MAY/JUNE 86

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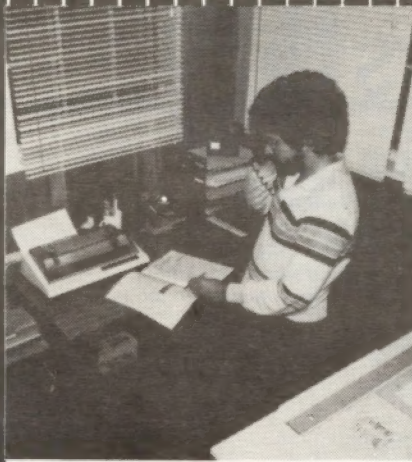
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Editor's Corner

It's been a very busy two months. We went out on the road, embarked on a new subscription drive, went into the book publishing business, and prepared to add an additional 850 square feet of storage and work space to our operations.

I have especially enjoyed the letters we have received. Your suggestions and notes of encouragement have helped to decide the upcoming format of TIME DESIGNS. I think that you will welcome some of the planned improvements...more T/S 1000 info (continued coverage of the 2068/Spectrum and QL). There will be articles and columns for a variety of special interests like the operation of full-size printers, hardware modifications, and programming tricks. And let's face it, not everyone owns a floppy disk system. There are some very good alternatives like the Sinclair Microdrive, Rotronics Wafadrive, A&J Micro Drive, and yes, even the old reliable cassette (check out Michael Carver's excellent cassette utility in this issue). We want to offer tips on all types of mass-storage medium.

Have you been following along in our Classified ad section? All subscribers can place one free personal ad in each issue. More details can be found in that section. Our Classifieds have been growing. In fact, we now have more Sinclair-related ads than a large popular "buy, sell, and trade" computer tabloid. I recently obtained a program that is advertised in the Classifieds called the "Money Machine" by Herb Bowers. It is a word game similar to the "Wheel Of Fortune" TV game show. I was impressed with the detail that Mr. Bowers included in his game. Folks, there's treasure in them thar pages. Check out the Classifieds.

Renewal Time?

Keep America's foremost Sinclair magazine coming to your door (and help our overworked secretary too!). An early renewal is appreciated. Simply send a check or MO for \$15.00 and state that it is for a renewal. If you happen to have a label from the envelope your magazine came in, send it along too. Your subscription expiration date is on this label. And just in case you forget, our secretary will send you a reminder notice. Thanks for your continued support.



Letters

"As I have a Spectrum +, Interface One, two Micro-drives, Beta Plus DDI (with Amdek III), a working 2050 attached, a rather large assortment of Spectrum software and subscriptions to 4 UK Spectrum-dedicated magazines, I tend to regard myself to be a Spectrum buff. Therefore, I would like to offer this selection of my favorite 1985 Spectrum favorites. The following programs are not in a specific order, they are all great."

1. Artworx (Novelsoft/Zebra)
2. Fairlight (The Edge)
3. Tomahawk (Digital Integration)
4. Beta Basic 3.0 (BetaSoft)
5. Music Typewriter (Romantic Robot)
6. Dun Darach (Gargoyle Games)
7. Monopoly (Leisure Genius)
8. Everyone's A Wally (Mikro-Gen)
9. Frankie Goes To Hollywood (Ocean)
10. Astronomy II (CP Software)

Ian F. Robertson
Islington, Ontario
Canada

Dear Sir:

"I've just read your response to Byron DeFries on page 3 of the March/April issue. There may be a bit more of a problem than you mention. You are right about the frequency difference (50 vs 60Hz) but that is minor, and most self-respecting transformers are specced from 47 to 63 Hz to cover it. The need for a new transformer (or adaptor) arises because the British line runs about 230 VAC compared to our 117.

The big problem I foresee is that the British television uses a different scan pattern and frequency from the American one...625 lines by 50 frames. Also, without checking, the channel frequencies may be different. Thus plugging into a British TV won't work. Using a video monitor obtained in the U.K. may have a similar problem. Here, the monitors follow the U.S. 525 line 60 frame television pattern. (One likes to make the frame rate the same as the line frequency to reduce the demand for power filtering and isolation.) If the UK video monitor follows their TV standards, the 2068 won't work through that device without modifications either. Now, I haven't torn into my 2068 and looked, but it's possible that there's a jumper change that will adapt the machine for the British (or other European) standards."

David Mc Lanahan
Marlow, NH

EDITOR: Or, Mr. DeFries could try to hook-up his 2068 to a Sinclair Pocket TV. It's compatible with both British and American standards. I understand someone has accomplished this successfully...although they are wearing thicker lenses now.

"I purchased an FD-68 Disk Drive I/F from AERCO in December, 1985. The system disk they sent me was unreadable, and it was returned to them in December for a replacement. I waited very patiently until the first of February, at which time I decided to call them (perhaps they had not received my letter?).

I spoke to a Phil [at AERCO], and was very upset by his attitude. I was advised that he had been busy doing 'other more profitable projects' and that he really did not want the Timex business. I was quite upset. After speaking with Rod Gowen of RMG Enterprises [an AERCO dealer in my area], I was advised to speak to Jerry at AERCO...

The first of March I was again on the phone to AERCO. This time I was able to speak to Jerry, who was very accommodating. Jerry apologized and sent a new disk out the same day, Air Express. Unfortunately, it was also unreadable.

I then spoke to Jerry again. He shipped me a 5.25" disk drive and disk, set up as drive C, for me to make my own copy. This was also sent Air Express! I ended up getting a copy from Jack Dohany, a programmer in California, and did not need to use the drives sent to me by AERCO. However, their efforts were extraordinary.

I am writing [this letter], as I was very vocal about poor service and attitude, and aware of others having the same problem, as evidenced in our recent user group newsletter. However, I cannot say enough good things about how I was treated by Jerry. I therefore conclude that AERCO is really concerned about our business as well as servicing us after the fact. I would however suggest anyone who has a problem with AERCO should talk to Jerry...not Phil!

Unfortunately, a 'comedy of errors' such as I experienced can ruin a company's reputation. I have purchased other AERCO products in the past and will do so again. I felt after all my complaining, I should tell the whole story. Especially, the happy ending.

I hope you chose to publish this as I feel we owe the companies supporting our computers some good words. It always seems easy to criticize, yet hard to praise."

Syd Wyncoop
Portland, OR

EDITOR: Your last sentence hit the "bullseye". As a consumer, there seems to be no excuse for poor service and (gasp) mistakes. But as a small business owner, I know what goes on "behind the scenes". Often just a couple of employees are wearing the hats of several dozen workers. The word "busy" is an understatement! I feel that the majority of our T/S vendors take customer satisfaction seriously. If not, I don't think they would be doing business for long...but remember, we all mess up once in awhile.

"I have found the Burglar Alarm program in the last [March/April] issue of TDM to be a useful addition to my TS 2068. However, I have found one problem. Generally speaking, when the program is loaded with the loop closed, the joystick port appears to be stuck in the 1's position (pin 1 to pin 8 closure). The program fails to recognize when an open occurs. If the program is loaded with the loop open, the system functions correctly. This situation may be unique to my own computer. However, I suspect that this is a flaw in the software.

The problem is that the closed loop indicator that is written into Register 14 of the PSG during the load procedure, cannot be cleared when the loop is later opened. The solution is to either load the circuit with the loop open, or clear Register 14 when the program is executed. I chose the latter solution. In the enclosed program(s), line 35 is used to call the machine code routine that clears Register 14 of the PSG. Line 15 calls the routine that POKE's the routine into high memory (lines 200-250). I have also shown the mnemonic listing of the machine code routine. Addresses FFE0 through FFE6 enable Register 7 of the PSG and set bit 6 in the register. Setting bit 6 in Register 7 enables I/O Port A (Register 14) of the PSG for output. Addresses FFE8 through FFED enables and zeros Register 14 of the PSG. The remainder of the routine re-addresses Register 7 and clears bit 6. This re-enables I/O Port A (Register 14) of the PSG for input.

Guil R. Taylor
Baltimore, OH

SAVE WITH LOOP	LOAD WITH LOOP	WITH MACHINE CODE	WITHOUT MACHINE CODE
open	open	ok	ok most of the time - but unreliable
open	closed	ok	fails to recognize open loop
closed	open	ok	ok
closed	closed	ok	fails to recognize open loop

```

10 REM Time Designs Mar/Apr 85
15 GO SUB 200
20 INPUT "Hit (ENTER) to activate alarm:" a$
30 PRINT "You have 30 seconds to leave."
40 RANDOMIZE USA 65504
50 PAUSE 1000
60 IF STICK(1,2)=1 THEN GO TO 50
70 PAUSE 1800 REM 30 second escape time
80 FOR y=1 TO 5
90   BEEP .4:ND BEEP .3:00
100  NEXT y
110 GO TO 50 REM Resets alarm
120 REM 30 minutes
130 FOR x=0 TO 60
140   NEXT x
150 REM TIME 1:00
160 PRINT "TIME 1:00"
170 GOTO 10

```

← Magazine Version

[illegible]

User Friendly Version

```

10 REM Time Designate Method
15 GO SUB "002
20 INPUT "Hit [ENTER] to activate alarm";$
81 30 PRINT:"You have 30 seconds  
to leave."
35 RANDOMIZE USR 65504
40 PAUSE 1800
45 CLS : PRINT FLASH 1 PAPER
6. AT 10,10,"ALARMS ACTIVE
50 IF STICK(1,2)=1 THEN GO TO
50
55 CLS : PRINT FLASH 1 PAPER
7. INK 7,Y AT 10,10,"CIRCUIT OPEN
56 PRINT AT 12,0,"Press any key
Y to deactivate alarm!"
57 IF INKEY$(*)="" THEN GO TO 12
0
60 PAUSE 1800 REM 30 second  
entrance time
70 FOR X=1 TO 5
80 FOR Y=1 TO 300
85 IF INKEY$(*)="" THEN GO TO 12
0
90 BEEP .1,20 BEEP .1,30
100 NEXT Y NEXT X
110 GO TO 45 REM Resets alarm  
after 5 minutes
120 CLS : PRINT PAPER 6 AT 12,0
;"Do you want to reactivate the  
alarm system? Y or N" FLASH 2 PAPER
SE 0
130 IF INKEY$(*)="Y" AND INKEY$(*)  
"N" AND INKEY$(*)="N" AND INKEY$(*)  
"n" THEN GO TO 120
140 IF INKEY$(*)="Y" OR INKEY$(*)="y"  
THEN RUN
150 CLS : PRINT PAPER 1 INK 7,  
AT 10,0,"Press RUN & ENTER to re-  
activate the alarm system." PAPER  
FLASH 1 PAPER
FLAS 0
160 STOP
170 FOR I=65504 TO 65526
180 REPEAT X POKE I,X
190 NEXT I
200 RETURN
210 DATA 65,7,2,11,245,60,64,211
220 DATA 66,14,2,11,245,175,60,64,211
230 DATA 67,211,245,175,211,245,201
240 STOP
250 SAVE "Alarm" LINE 10
```

TERRIFIC TIPS

**ZX/TS**

Quick Tip #1- Next time you have some epoxy mixed up, take the time to glue the key into the slot on your edge connectors (RAM Packs, ect.) by placing just a bit of glue at the top and bottom end of the key. I've had a few of these fall out and the results of misaligning a RAM pack could be disastrous when you power up. (Sinclair Canada does this on all their 16K RAMs.)

Quick Tip #2- If you are using Radio Shack TP-10 Printer Paper (Cat. No. 26-1332) in your 2040 printer, put two pennies at each end of the roll to keep the smaller TP-10 roll feeding evenly. (How's that for a cheap fix?)

Quick Tip #3- if you are still experiencing RAM pack wobble and the resulting "white-out", place some rubber or felt "sticky pads" under the rear two feet of your ZX/TS. This allows the RAM pack to hang off the edge connector, thus not wiggling loose as you press the keyboard.

Tip #4- Substitutions: Many tokens on the ZX/Ts computers have numeric values and will be interpreted as such while a program is running. Since tokens are usually stored in a single byte while numbers take up 6 bytes or so, this trick can save quite a bit of space at the expense of slowing down the speed at which the program runs. For example, rather than "LET Z=0", LET Z= "NOT PI", "SIN PI", or "TAN PI". Likewise, SGN PI = 1, INT PI = 3, COS PI = -1, PEEK NOT PI = 211, PEEK PI = 255, PEEK PEEK PI = 135, LEN STR\$ PI = 9, CODE STR\$ PI = 31, INT EXP PI = 23, and PEEK PEEK RND = 209. No doubt there are plenty more of these, and for numbers such as 2, which I have not found an expression for yet, use the function VAL. Instead of LET X = 2, LET X = VAL "2". A whole equation can also be surrounded by VAL, such as LET Z = VAL "2+(404/17)". You will be suprised at the memory saved by utilizing this trick.

Tip #5- Word Substitutes: In Print statements, strings and prompts, use keywords and tokens to save memory also. Instead of a line like- 20 PRINT "ENTER TODAY'S DATE", use- 20 PRINT "INPUT TODAY'S DATE", which saves 4 bytes. Do this by using the keyword THEN after the first quote mark, typing the I key for INPUT, and then deleting the THEN token. Since it is within the quote marks, the computer simply prints it. AND, STOP, THEN, NOT, FAST and RUN are also good candidates to use in this way. Experiment with these and have fun.

Anthony Willing

"If I told you that it was possible to get 100 ribbons for your printer for the price of one, would you be interested?"

As most of you, I have been frustrated with the cost and availability of ribbons. The way my printer runs, I have been known to use up more than a ribbon a week. Sometimes I run them until the print is barely legible.

I began to think that spending \$7.95 on a ribbon that is only about 24" long, was a real waste of money. Consequently, I began to experiment with alternative possibilities.

The outcome of my experimentation, is a simple, fast way to re-ink the fabric. And, since each re-inking takes only about four drops of ink, one bottle of ink can certainly re-ink more than 100 ribbons. However, the ink I used is not a standard office supply item that one can find at the corner store, but a special ink designed only for inking ribbons.

In order to buy the ink at a reasonable price, one was required to buy gallon lots...hardly the thing most of us want to do.

After discussing my idea with Rod Gowen of RMG Enterprises (1419 1/2 7th St., Oregon City, OR 97045), Rod agreed to package a kit containing enough ink to do at least 100 ribbons, applicator swabs, plastic "ageing bags", and instructions for \$7.95 plus \$2.00 shipping (the price of one store-bought ribbon).

If you decide to try one of these kits, remember that there are some tricks to getting the re-inking to work properly and evenly. So follow the instructions to the letter.

I'm sure that if you own a Gorilla Banana or clone, you will find this kit to be the bargain of the year."

Vincent Lyon

"I recently solved the code for using the GE 3-8100A (TXP1000) Letter Quality Printer with the AERCO printer interface. You use the pr-3 codes as described in the instructions, then do the POKES required to use RAND USER 64844 to COPY as the instructions suggest, then use the following POKE's, and it will work great:

POKE 64785,22 (Copy function Variable Line Spacing)
POKE 64836,24 (Printer Reset)

I have also modified ZPRINT (printer utility software from Zebra Systems, Inc.) for this printer. the changes are as follows:

use Epson Rx/Fx code (#5)

POKE 64601,24 (Printer Reset)

POKE 64617,51 (Variable Line Spacing for wide screen
POKE 64618,16 copy)

POKE 64625,51 (Variable Line Spacing for regular copy)
POKE 64626,22

POKE 64633,68 (Horizontal Tab for regular copy 17 is the
POKE 64634,17 left margin so change as you desire)
POKE 64636,9

Also of interest, you can POKE 64801,76 and get a half-width regular screen copy. This is normally 75--75=480 bit graphics mode and 76=960 bit graphics mode."

Lloyd C. Bowen Jr

***** IMPROVING THE ZEBRA GRAPHICS TABLET *****

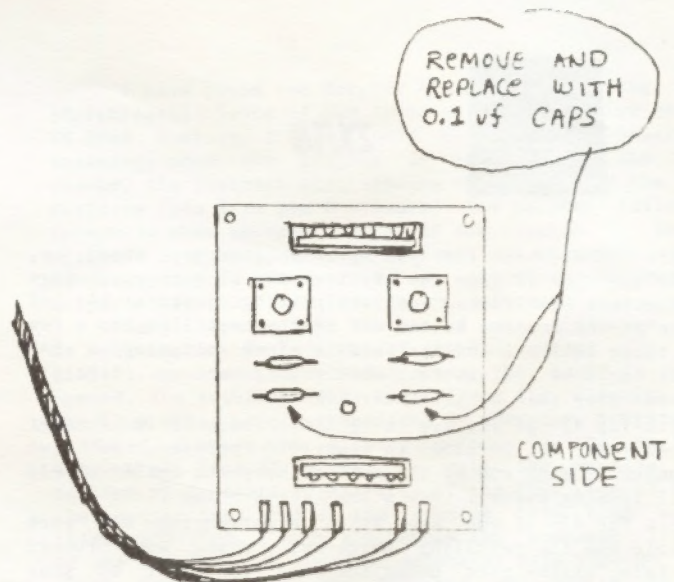
Users of the Zebra Graphics Tablet will have no doubt noticed the annoying behavior that I will term "Spray". If you don't press the stylus against the tablet very firmly, you get a wild spray of dots.

You may have also noticed that the "Spray" tends to be directed towards the center of the tablet. This is because there are a pair of centering resistors which cause tablet readings to return to center when there is no contact with the graphics tablet. The "Spray" phenomena is essentially micro separations of stylus contact. The duration of these micro separations is very short but the cursor instantly centers on each separation event, therefore causing the "Spray".

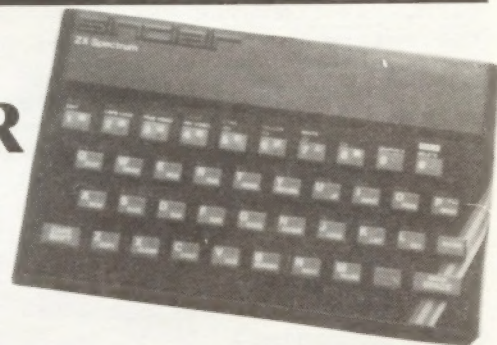
By eliminating the instant centering of the tablet you will be eliminating the "Spray" phenomena. You can do this by removing two resistors and replacing them with 0.1 uf capacitors. To do this follow the instructions below...

- 1) Place the tablet upside down and remove 7 screws.
- 2) Carefully separate bottom of tablet from top. Unplug two connections from the pc board inside.
- 3) Unscrew the pc board from bottom of the tablet.
- 4) Desolder the two resistors indicated in the diagram.
- 5) Solder two 0.1 uf ceramic disc capacitors into the vacated resistor locations.

Put your graphics tablet back together (this may be a bit tricky) and try it out. You will notice a significant improvement in performance.



Special Report: AMSTRAD BUYS SINCLAIR



On Tuesday, April 8th, the news was out...Sir Clive Sinclair had sold his home computer technology and company name to a one-time rival, Amstrad Consumer Electronics PLC. The transaction has been called the "end of an era in British Computers".

While the sale was unexpected, close observers of the U.K. computer market were not completely surprised. Sinclair had been operating in the red for over a year, and just recently rescheduled its overdue debt. Major creditors included Barclays Bank and the Timex Corporation. Sir Clive, in recent interviews had expressed dissatisfaction in the marketing end of the computer business. "I always said I was an inventor," he said. "Once a product is developed, I want to get out."

TIME DESIGNS had been investigating an unusual situation that was occurring at the Boston office of Sinclair Research, when the sale was announced to the press. No one had been answering the telephone...and a rumor had it that the office had moved to New Hampshire. A call to the Boston telephone company confirmed that their phone lines had been disconnected.

It is evident, that Amstrad, who has been having a successful year in the consumer electronics market, wanted an entire corner on the home computer market. The prime justification for the the \$7.3 million acquisition of Sinclair. Alan Sugar, chairman of Amstrad commented that the Sinclair line of computers, less-expensive models mainly designed for home use, would complement Amstrad's line of business oriented computers and word processors (which are less entertainment oriented).

The Sinclair deal includes the use of the Sinclair brand name and the world-wide rights to sell and make Sinclair computer products. These include the current Spectrum models, and some other computers that were scheduled for future release. At press time, the Sinclair QL was still up in the air. It has been widely published, Alan Sugar's displeasure of the QL. An Amstrad spokesperson told Time Designs that "the QL was never the success that Sir Clive had intended...our marketing department is taking a long, hard look at the QL...before any decision will be reached". It should be pointed out that Amstrad's own small business-type computer, the 128K PC, caters to the same market as the QL. A recent American deal with Sears, will give the Amstrad models a big boost in sales.

Sir Clive, has retained the rights and interests to the Microdrive wafer technology and the C-5 experimental vehicle, among some other technologies. The flat-screen pocket TV marketing and manufacturing rights were given to Timex to pay-off an outstanding debt. When all of the transactions are complete, Sinclair Research "won't owe any money and will have some assets," Sir Clive has stated.

A new company is being formed by Sir Clive, which will do research for other companies on a contract basis. Most of Sinclair's key engineers and researchers will go with Sir Clive. One project that had been previously hinted at before the sale to Amstrad, was an inexpensive portable telephone using cellular phone technology. Also, it is known that Sir Clive has privately expressed interest in developing his very own revolutionary computer system...considering that his other computers had gone in other directions than intended. Haven't we heard this one before?

As for Amstrad, they will continue to sell Spectrums (Plus and 128K models) until existing contracts with suppliers have expired...then will shift manufacturing to their own factories. When Time Designs asked Amstrad recently, if they intended to bring the Spectrum to the U.S., a spokesperson replied, "Not at this time, but Amstrad has always had a policy of...if a market exists, we'll be there." It was then immediately pointed out that 100,000 or more Spectrum's were already in use in America...in the form of the Timex/Sinclair 2068.

The British Sinclair market appears to be un-daunted for the time being. There are stock-piles of computers and related s/w and h/w in warehouses. Enough to keep the market going for some time. After that, it's up to Amstrad, or perhaps Sir Clive (?).

As a last note, the much discussed Sinclair C-5 electric three-wheel vehicle (sold for a short time in the U.S.), will briefly appear on American Network TV. The popular Late Nite With David Letterman Show on NBC will feature the high-tech "tricycle" in a futuristic comedy spoof called "The Regulator Guy". Actor/comedian Chris Elliott will drive the C-5 around the stage.

QL GETS A+ SUPPORT

The American version of the Sinclair QL has been rescued. A Keene, New Hampshire firm, A+ COMPUTER RESPONSE, has purchased the entire U.S. inventory of QL's and will be distributing the computers to a network of 12 established T/S dealers. A+ Computer Response is a PC and small systems sales, service and consulting company in the New England area. Close ties with Nigel Searle (former marketing director of Sinclair), brought the U.S. QL market to the attention of A+ managers, George and Carol Whitham, which eventually led to the Sinclair deal.

A+ Computer Response has announced to their QL dealers that there are adequate supplies of computers and peripheral support to last several years. They will also pursue the possibility of securing additional QL stock in the future.



Carol Whitham, General Manager of A+ Computer Response of Keene, N.H., shakes hands with Terry Shurwood of Sinclair Research Ltd., Cambridge, England after their agreement was finalized for the purchase of the entire inventory of American QL's.

MID-WEST TS COMPUTERFEST

Reported by Tim Woods

The Mid-West TS Computerfest held in Cincinnati, Ohio on May 3rd and 4th was a great success, and enjoyed by all those who attended. It was the largest assemblage of Sinclair dealers, services and nationally-known personalities ever. One individual commented that he had attended the Boston TS Celebration in 1983, and preferred the Mid-West show, as it was geared more to the user and after-market dealer (since the Timex Corporation had dominated the Boston event).

The large Ramada Inn at I-75 and Sharon Rd. was the location of the TS Computerfest. Over twenty exhibitors were featured in the main convention room. Another smaller room was used for special guest speakers and displays. The official Hospitality Suite was open on Saturday for informal gatherings. Good conversation, advice and computing tips abounded.

There seemed to be a little something for everyone. The TS Connection had a table with surplus 2068 and ZX81 spare parts...for those who like to dabble with the soldering iron. The Zebra Systems booth was always crowded, since they had brought a van-load of TS computer merchandise (many items at great prices). There was a booth that had a home-brew banked-memory board for the 2068, with a reported 12 meg. bytes. A QL mouse was demonstrated at the Russell Electronics exhibit. Dave Maccarone of Damco Enterprises featured his excellent new Spectrum Rainbow Interface and the Wafadrive system. Some of the users groups were supplying free "public domain" software for the price of a cassette tape.

There was so much more at the Mid-West TS Computerfest...more than we have space for. I would like to thank the Computerfest committee for the fine job of sponsoring the event. I understand that another show is already being planned for next year. I can hardly wait!



Ray Payne and Joe Ayello of Knighted Computers were very successful at the Computerfest, selling more new computers (QL's) than any other dealer present. Also they announced some new software for the 2068 will be available soon.



Jerry Champkif of AERCO gave an informal demonstration on floppy disk trouble-shooting, shown here at the TS Computerfest Hospitality Suite. AERCO also demoed their new CP/M system for the 2068.



Host Gary Solomon of Brice Road Pharmacy (a QL dealer) introduces George and Carol Whitham of A+ Computer Response, who donated a complete QL package (computer, monitor and printer) for a door prize...a \$900 value.



A correspondent for the Wall Street Journal meets Mark Fendrick, a correspondent for the U.K. magazine, ZX Computing Monthly. The Wall Street Journal will run an article about the Computerfest.



An attendee browses at the Time Designs booth. The new 2068 Technical Manual (published exclusively by Time Designs) was premiered at the Computerfest, and received quite a bit of attention.



The gang from Zebra Systems, Inc. (left to right: programmer Jeff Street, general manager Stewart Newfeld, and Stewart's brother Bill filled in for the weekend) sport their large and diversified product line.



These three smiling gents are members of The Greater Cleveland Sinclair Users Group. Several other groups from Ohio, Wisconsin, Michigan, and Indiana also had displays.



Tom Woods demonstrates one of his new experimenter boards to a customer at the Syncware News booth. Tom also gave a talk on filing-type programs during one of Sundays small group sessions.

Product/Dealer News

E. Arthur Brown Co., 3404 Pawnee Dr., Alexandria, MN 56308, (612) 762-8847; has secured the publishing rights to HACKER'S HANDBOOK in the U.S. This best-selling book from Great Britain is a resource and technical reference guide to telecomputing. Only \$12.95 plus \$1.95 S&H.

New Larken Disk Drive Interface Board for ZX-81/TS 1000/1500. Controller board is similar to Larken 2068 Disk I/F, but has a custom DOS for the ZX-81, and is reported to be user friendly. Board requires double-sided 5.25" drive. Price: \$95.00 (U.S.) for single drive board, or \$99.00 for 2 drive capacity. \$4.00 for drive cable (all other cables are supplied); plus \$5.00 S&H. Larken Electronics, RR#2 Navan Ontario, Canada, K4B-1H9.

Zebra Systems, Inc., 78-06 Jamaica Ave, Woodhaven, NY 11421 (718) 296-2385; introduced two new programs for the 2068 at the Mid-West TS Computerfest... "The Banner Designer" and "The Sign Designer". Combined with the previously available Greeting Card Designer program, there are three members of to Zebra's Graphics Design Series. With a full-size dot matrix printer and a 2068, it is possible to design and create custom 8½"x 11" signs, banners and greeting cards. The programs are priced at \$19.95 each (plus \$3 for total order S&H). Zebra Systems also informed TIME DESIGNS that they are extending the sale and special pricing featured in their yellow Anniversary Sale flyer, until the end of June.

Weymil Corporation, Box 5904, Bellingham, Washington 98227; has a comprehensive high-resolution graphics software package for the Timex Sinclair 1000, called THRUST. Thrust features both on-screen hi-res and 2040 printer hi-res graphics. The package includes both "Sincartist 1.3" and "Sincartist HR" on one cassette tape for \$20 ppd. The Thrust package comes with complete documentation, and is compatible with Paul Hunter's memory board.

New address, and new Sinclair catalog available from: Variety Sales, 325 W. Jersey St. #2D, Elizabeth, NJ 07027 (201) 289-5699.

Free Sinclair QL software and hardware catalog (very nicely illustrated) available upon request. Write to: EMC (English Micro Connection), 15 Kilburn Ct., Newport, RI 02840, (401) 849-3805.

Users Group Update

Has your Timex Sinclair (or Sinclair Timex) Users Group been mentioned in a past issue of TIME DESIGNS? We have brought together both interested users and active users groups. Send information about your group to: TDM, 29722 Hult Rd., Colton, OR 97017.

South Eastern Michigan Computer Organization (SEMCO)
P.O. Box 02426
Detroit, MI 48202
Contact: Liam Neary

Chicago Area Timex Sinclair Users Group (CATSUG)
c/o Gary Lessenberry
1885A Yorktown Ave.
Great Lakes, IL 60088
(312) 473-9415
or contact:
Mark Biery
741 Dunbar
Beecher, IL 60401
(312) 946-6892

Amarillo Timex Sinclair Users Group
c/o Joe Jenkins
3100 Mockingbird
Amarillo, TX 79109

T/SUG of Fort Worth, TX
c/o David Baulch
4424 Geddes Ave.
Fort Worth, TX 76107

Hampton Roads T/S Users Group
c/o David Alford
112 Kohler Cres.
Newport News, VA 23606

Indiana Sinclair Timex User Group
c/o Frank Davis
513 East Main St.
Peru, IN 46970
(317) 473-4885

Greater Cleveland Sinclair Users' Group
c/o J. G. Dupay (newsletter editor)
6514 Bradley Ave. (dn)
Parma, OH 44129

Misc.

Everett Talavera of the G.U.T.S. DE MEXICO (TS Users Group in Mexico City) sends the report that Timex of Portugal is coming to the Mexican personal computer market. Timex representatives met with group members and discussed the computer models that will be introduced...the Timex 1500 computer (has a black case), the Timex 2048 (basically a Spectrum in 2068 clothes, with Kempston joystick I/F built-in, and no cartridge port), the Timex 2080 dot matrix printer, and the

Portuguese 3" Disk Drive System with C/PM. Talavera states that, "If things work out... they plan to bring the Timex 2068 and the [Sinclair] QL." He also added, "They [Timex/Portugal] told us that the first shipment was for 10,000 units." Mr. Talavera welcomes any correspondence from other Timex Sinclair users and users groups. Write to: G.U.T.S. DE Mexico, Tlaloc #21, Col. Tlaxpana, C.P. 11370, Mexico, D.F.

The Super-QL

USING THE SINCLAIR QL WITH 640K RAM

by Mike de Sosa

Used with additional memory, particularly a 512K RAM card, the Sinclair QL is transformed, as are its bundled software programs. Even though the JSU ROM and Psion 2.1 software supplied with the North American version of the QL do not take the fullest advantage of additional RAM, use of the bundled software is profoundly improved, especially if RAMdisk software is employed. Both the memory card and various RAMdisk software systems are available for a combined price of about \$150.

The following tests were made using a standard North American version of the QL equipped with a PCML 512K Memory Expansion card. Three versions of RAMdisk software were tested, each with distinct advantages and disadvantages: Eidersoft's I.C.E. ROM cartridge used with CHOice RAMdisk/multitasking software on Microdrive cartridge; QJUMP's (Tony Tebby's) PCML Toolkit version 0.07 complete on ROM cartridge; and Qflash's RAMdisk Driver 2.5.

The PCML RAMPack works excellently and would seem to have only two drawbacks: it is extremely difficult to install on the North American version of the QL whose peripheral expansion slot seems to have obstructions that the European version does not, and it takes considerably longer for the copyright screen to appear after "power-on" or resetting the QL.

I.C.E., for Icon Controlled Environment, is a ROM-cartridge program that is supposed to make operation of the Sinclair QL "simple and convenient", replacing the "mysterious commands" of the QL operating system or QDOS with an elaborate "point and click" sequence. The I.C.E./CHOice combination attains full efficiency only when used with extra memory and an Eidersoft "mouse" (hand controller) which plugs into the ROM cartridge port. The latter is a new addition to the Eidersoft family, and its design necessitates that previous I.C.E. owners return their ROM cartridge for credit towards an I.C.E. system-cum-mouse. The Eidersoft rodent (not available for testing) is a three button model, similar to that for the Atari ST.

The CHOice s/w is sold separately on Microdrive. CHOice, which included a bonus Archive name and address database and a mailmerge system, may be used as a RAMdisk driver without I.C.E. but requires the latter--insofar as I could determine--for its currently unique multitasking system. This system permits suspending operation on one Psion software program, switching rapidly to another operating Psion software program (or to the I.C.E. facility), and returning to the original program at the exact point you left it, with any and all loaded files intact--a very valuable feature, indeed, but one that would be even more useful, if it required less (undocumented rigamarole to set it up and if it were somewhat more flexible in use.



Programs like I.C.E. that override a computer's basic operating system are sometimes referred to as "front end" programs. The I.C.E. screen display format always comes on at "boot-up", regardless of the program cartridge used. This means that you can't set the computer clock or boot a program directly with the I.C.E. cartridge in place. (An option should be given the user--by keying F3 or F4, perhaps--to bypass I.C.E., which slows entry into programs.)

The I.C.E./CHOice documentation contains four or five egregious errors and omissions which add unnecessary hurdles to the process of learning and familiarizing one's self with an already complex and daunting system. Following is an abbreviated checklist for using I.C.E. "without tears". (Eidersoft technical writers could, no doubt, improve upon this checklist, but they should have done a lot better in the first place; the nearly universal problem of poor documentation continues to plague the computer industry at all levels.)

1. With power to the QL disconnected, carefully insert the I.C.E. ROM-cartridge into the cartridge port of the QL.
2. Power up, and familiarize yourself with the use of I.C.E. as described in the I.C.E. User's Manual, hereafter the IUM.
3. Insert the CHOice Microdrive cartridge in Microdrive 1 and a blank formatted cartridge in Microdrive 2. (Formatting a cartridge with I.C.E. is discussed on pages 8-9 of the IUM).
4. Put the small arrow in the MDV 1 icon (picture) and "click" the spacebar twice to bring up the CHOice directory. (The IUM uses the word "directory" as a verb to describe this process.)
5. Put the arrow in the BACKUP area of the function strip and click once to prepare a full backup copy of the CHOice cartridge. (This is your backup of the CHOice master cartridge which contains 31 files and uses 170 sectors; this is not your working copy of CHOice.)
6. Remove the CHOice master cartridge from Microdrive 1, store it with the crown jewels, and insert the backup master cartridge just prepared in Microdrive 1. Insert another blank formatted cartridge in Microdrive 2. Bring up the CHOice directory again, put the arrow in the CLONE BAS icon, and click twice. (This copies 17 files from the backup master CHOice cartridge onto the RAMdisk/multitasking working copy of CHOice, which you should further configure and add to meet your needs.)



7. Remove the backup master CHOice cartridge from Microdrive 1 and insert your working copy of CHOice. (To install RAMdisk software, bring up the CHOice directory on MDV 1, put the arrow in the BOOT icon, and click twice; when the CHOice menu appears, click once.)

8. To establish "multitasking" suites--using Psion software or other programs--repeat the above procedure; when the CHOice menu appears, position the highlight bar on INSTALL TASKS, click once, and follow screen instructions as explained in the IUM.

NOTE: To use RAMdisk with multitasking, the following steps must be followed in strict sequence. First, having previously installed and saved a multitasking suite of one or more Psion software programs and I.C.E., and having reset the QL, (1) execute the BOOT program and follow instructions on "Install Ram Disk", (2) execute a multitasking suite [a "T" file] and follow screen instructions. Third, return to I.C.E. and format and load your RAMdisks. (Multitasked programs should not be included on RAMdisks used with multitasking suites; PRINTER_DAT and HOB files are the only essential Psion software subprograms.) Programs to be multitasked should be configured for use with RAMdisk using the CONFIG BAS program found on the Abacus Microdrive cartridge.) Finally, click the QUIT function to return to the Task Controller (multitasking) menu.

Although all four Psion software programs may be multitasked simultaneously with I.C.E., only two--or, at most, three--can be used together practically.

Following are a table listing the number of sectors required on RAMdisk for various Psion software programs and sub-programs, and a proposed scheme for using task suites composed of (1) QL Quill--Word Processor and QL Archive--Database and (2) QL Abacus--Spreadsheet and QL Easel--Business Graphics. (If task suites are not to be used, format RAMdisks for the higher value and copy essential elements of the Psion software programs on RAM-disk.)

Quill (WP): 52330 bytes, 52K, 104 sectors

printer_dat: 142 bytes, 1/2K, 1 sector

quill_hob: 8128 bytes, 8K, 16 sectors

FORMAT RAM1_25 or FORMAT RAM1_125

Archive (DB): 52318 bytes, 52K, 104 sectors

printer_dat: 78 bytes, 1/2K, 1 sector

arch_hob: 31232 bytes, 31K, 62 sectors

FORMAT RAM2_65 or FORMAT RAM2_170

Abacus (SS): 51784 bytes, 51K, 102 sectors

printer_dat: 113 bytes, 1/2K, 1 sector

aba_hob: 20992 bytes, 21K, 42 sectors

config_bas: 7995 bytes, 8K, 16 sectors

FORMAT RAM3_45 (61) or FORMAT RAM3_165

Easel (BG): 52684 bytes, 52K, 104 sectors

gprint_prt: 520 bytes, 2K, 4 sectors

easel_hob: 17408 bytes, 17K, 34 sectors

FORMAT RAM4_40 or FORMAT RAM4_170

Establish a numbering convention for your Psion software programs and their respective datafiles so that you may configure the programs (using CONFIG BAS which is found on the Abacus [Spreadsheet] Cartridge) accordingly. If you can spare the cartridges, clone and configure another set of Psion software programs for use with the Microdrives when you do not wish to use RAMdisk.

If you wish to multitask Quill, Archive, and Abacus using CHOice, I recommend the following RAMdisk program and datafile sector lengths:

Quill program 25/data 200 sectors;

Archive program 66/data 100 sectors;

Abacus program 47/data 60 sectors.

In this case, I would configure Quill to read system and HELP information from RAM1 and data from RAM5 and format RAM1 25 and RAM5 200. When installing the tasks, enter 50 sectors working space. This will leave about 10K free--a bare minimum for trouble-free operation.

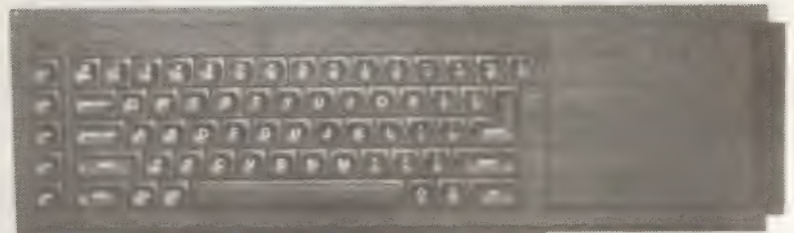
It is more practical to multitask only two Psion software programs at one time using CHOice. I have installed Quill and Archive together and Abacus with Easel. Multitasking only two Psion software programs at a time permits the use of larger working spaces (100 sectors) for each program and larger datafile RAMdisks (240 sectors) with more free memory.

The way I.C.E. and CHOice are set up precludes "automating" such things as the formatting and loading of RAMdisks which must always be done manually using the "point and click" system.

Aside from its important virtue--unique at the time of writing--of permitting rapid switching between Psion software programs without losing your place, I.C.E. seems to have little merit. Other systems, employing such things as redefined keys, an effective screen calculator, additional SuperBASIC extensions, and one's own defined procedures, seem far more efficient to me.

A system which permits all of those features is the PCML Toolkit, version 0.07, designed by Tony Tebby, author of QL Toolkit and the new QL SuperTOOLKIT 2. Available now from CARE Electronics in the U.K. as a ROM cartridge EPROM or on Microdrive, this utility ROM includes an efficient RAMdisk driver and 27 SuperBASIC extensions, including RAM USE (key in or program RAM USE ram or RAM USE mdv, as desired) and a very rapid Microdrive-to-RAMdisk-to-Microdrive copying system (WCOPY). Additional SuperBASIC extensions provided by the utility are SPL, JOBS, RJOB, SPJOB, AJOB, STAT, WSTAT, WDIR, WDEL, WDEL F, VIEW, RENAME, TRUNCATE, CLOCK, DATA USE, SPL USE, EXTRAS, FLEN, FTYP, FDATA, FOPEN, FOP_IN, FOP_NEW FOP_OVER and FOP DIR.

Not directly compatible for simultaneous use with the original Qjump QL Toolkit, it is easily patched to do so. (Send 25 cents and a S.A.S.E. for a copy of Qjump's patch which will permit any version of QL Toolkit to operate properly with the PCML Toolkit.)



Listing #1 is a boot program for using Quill and Archive together on RAMdisk with the PCML Toolkit. The basic program and defined procedures and functions, some of them utility functions, which comprise the listing are, for the most part, self-documenting. The machine code programs qdtg, minicalc, and quillkey are the clock program listed on page 42 of the "Concepts" section of the Sinclair QL User Guide, Q_CALC, and KEYDEFINE,

respectively, which are multitasked with the Psion software programs. The latter two are products of Psientific Software.

Listing #1 may be easily modified to suit your needs and the type of RAMdisk software possessed.

The Qflash RAMdisk Driver 2.5 is a no frills utility on Microdrive cartridge. It has three distinct advantages over the other systems: it is by far the fastest--noticeable when using large files with RAMdisks; it is the most efficient in that RAMdisks do not have to be formatted and are flexible in length; and it is the most flexible, permitting any type of "automatic" system to be devised. It has two disadvantages, both of which are to be corrected in later versions: it has no RAM_USE facility and no selective fast copy routine. No RAM_USE facility is a mixed disadvantage in that it permits more direct access to RAMdisk and Microdrive files. The Qflash RAMdisk Driver 2.5 is available directly from Qflash, Post box 10 21 21, D-2000 Hamburg 1, West Germany, telephone (Hamburg) 040-6512742 or 040-7650461, \$27 ppd.

Use of the Qflash RAMdisk Driver is quite straightforward, and its documentation is excellent, factors which enable the user to employ RAMdisks readily in a variety of uses.

The use of additional memory and RAMdisks might well fulfill all of your QL computer needs without resort to floppy disks. It seems to be working for me.

NEXT TIME: "Games for the Sinclair QL: A Potpourri", and the results of the First Annual Thomas B. Woods Award Contest.

Listing 1. PCML RAMdisk Boot Program

```
1 CLEAR: q=0: w=0
2 WINDOW 512,256,0,0: CSIZE 1,1: PAPER 2: IN
K 7: CLS
3 AT 7,6: PRINT "LOADING QL QUILT-ARCHIVE"
4 AT 9,2: PRINT " Do you wish to use RAMdisk
? (y/n) "
5 IF NOT INKEY$(-1)="y": w=1: GO TO 29
6 AT 9,40: PRINT "Y": AT 11,2: PRINT " Key '
0' for QUILT only or 'B' for both QUILT and
ARCHIVE"
7 IF INKEY$(-1)="q": q=1: GO TO 8
8 AT 0,38: PRINT "ram1_ = ";
9 FORMAT ram1_210
10 AT 2,38:PRINT "ram5_ = ";
11 FORMAT ram5_240
12 IF q=1: GO TO 17
13 AT 4,38: PRINT "ram2_ = ";
14 FORMAT ram2_210
15 AT 6,38: PRINT "ram6_ = ";
16 FORMAT ram6_250
17 PAUSE 200: CLS
18 PRINT " COPY DESIRED MDV1_ FILES TO RAM1
_"
19 WCOPY mdv1_,ram1_
20 CLS: PRINT " COPY DESIRED MDV2_ FILES TO
RAM5_"
21 WCOPY mdv2_,ram5_
22 IF q=1: GO TO 28
```

```
23 CLS: PRINT " Insert ARCHIVE program cartr
idge in Microdrive 1":PRINT " and ARCHIVE
datafile cartridge in Microdrive 2": PRINT
" then key and ENTER 'C'": STOP
24 CLS: PRINT " COPY DESIRED MDV1_ FILES TO
RAM2_"
25 WCOPY mdv1_,ram2_
26 CLS: PRINT " COPY DESIRED MDV2_ FILES TO
RAM6_"
27 WCOPY mdv2_,ram6_
29 CLS: AT 5,2: PRINT " Do you wish to set c
lock? (y/n) "
30 IF INKEY$(-1)="y": AT 7,0: PRINT " Perfo
rm SDATE yyyy,mm,dd,hh,mm,ss": STOP
31 AT 8,0: PRINT " Key and enter QUILT or
ARCH": PRINT " (If not using RAMDisk,"
PRINT " insure correct cartridge in mdv
1)": STOP
```

```
9000 REMARK PROCEDURES & FUNCTIONS
9002 DEFINE PROCEDURE quilt
9003 IF w=1: w$="mdv1_": ELSE : w$="ram1_"
9004 WINDOW #0,400,20,35,215
9006 IF w<>1: EXEC w$&"mini_calc"
9008 EXEC w$&"quilt_key"
9010 EXEC w$&"qdtg"
9012 EXEC_W w$&"QLWP"
9014 OPEN #1,con: OPEN #2,con
9016 END DEFINE
9018 DEFINE PROCEDURE arch
9019 IF w=1: w$="mdv1_": ELSE : w$="ram2_"
9022 EXEC_W w$&"ARCHIVE"
9023 OPEN #1,con: OPEN #2,con
9024 END DEFINE
9026 DEFINE PROCEDURE SRAM
9028 CSIZE 0,1
9030 CLS: AT 6,0: INK 2: PRINT "INSERT QU
ILT DATA CARTRIDGES IN mdv1_ & mdv2_": PAUSE
300: INK 4: CLS
9034 WCOPY ram5_,mdv2_
9036 CLS: WDIR: PAUSE 300
9038 CLS: AT 6,0: PRINT "CHECK QUILT DATA
CARTRIDGE IN MDV1_ OR KEY 'Q'": PAUSE 300
9040 WCOPY mdv5_,mdv1_
9042 WDIR mdv1_
9044 END DEFINE
9046 DEFINE PROCEDURE reb
9048 RAM_USE ram
9050 INK 2: CLS: PRINT "Key and ENTER QUIL
L or ARCH"
9052 END DEFINE
9054 DEFINE PROCEDURE SRAM3
9056 CSIZE 0,1
9058 CLS: AT 6,0: INK 2: PRINT "INSERT AR
CHIVE DATA CARTRIDGES IN MDV1_ & MDV2_": PAU
SE 300: INK 4: CLS
9060 RAM_USE ram
9062 WCOPY ram6_,mdv2_
9064 CLS: WDIR: PAUSE 300
9066 CLS: AT 6,0: PRINT "CHECK DATA CARTRI
DGE IN MDV1_ OR KEY 'Q'"
9068 WCOPY ram6_,mdv1_
9070 CLS: WDIR mdv1_
9072 END DEFINE
9074 DEFINE PROCEDURE C
9076 CONTINUE
9078 END DEFINE
```

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Editor's Note: "Quick Look" is a new software review column for the QL. The concept and graphics were designed by TIME DESIGNS regular, Paul Bingham. The "scorecard" rating system will be used, and may be adopted for the T/S 2068 and 1000 reviews as well.

QSPELL

A REVIEW
by Paul Bingham

The very reason this dedicated 208 owner bought a QL was because there was a spelling checker program available for it--something I had been waiting in vain to see for the 2068. Spelling has always been a real problem, solved up until now with two spelling texts, four dictionaries, or using the PC and hard disk at work, with an 80,000 word proof reader program. Now it would not be fair to compare QSPELL with a program for hard disk, so I won't. After all, the QSPELL dictionary fits within 70K.

QSPELL loads its thirteen sections (some of which are in BASIC) in just under on and a half minutes. The program is very professional, making good use of color and windows. All the menus are icon-driven, point-and-press easy. A mouse would work great! The instruction booklet appears to have been done on someone's typewriter. This is perfectly acceptable of course, except that the instructions are a little ambiguous in places including (believe it or not[!]) at least on spelling mistake. The help screens are almost verbatim what is written in the booklet.

The program itself has many procedures. One makes a QSPELL version of Quill with which is is compatible. Another allows access to the 25,000 word dictionary to add to it, delete from it, even erase it entirely and start over. For puzzle buffs, QSPELL allows a word to be entered with question marks in place of one or many letters. QSPELL then quickly lists the word or words that fit the bill. Its almost like cheating for crosswords, but it can effectively be used to teach proper spelling. By entering a prefix followed by "*" the program almost instantaneously produces a list of all the words beginning as such. QSPELL will also list all words possible from another word's letters or solve anagrams.

But the real reason to buy a spelling checker is to check spelling. After taking the limits of 70K into account, I assumed they had put mostly small words in the list to reach 25,000. So I dug out my spelling texts and went to work. One book has a list of over 500 of the most commonly misspelled words from studying some 11,000 business memos. I ran this list through and 81% were in QSPELL. I then ran through a list of "demons" (hard-to-spell words many of which no one uses) like crevasse, khaki, and larynx. Surprisingly 42% of these were there, too. With QSPELL's Auto-Learn feature, such a list can be easily added to the dictionary and saved.

Proofreading takes about 20 seconds per full page and will highlight on the scree or on a printout (in BOLD type) words QSPELL does not recognize. Puzzle mode can then be accessed to help find the correct spelling or you can resort to your old Webster's on the shelf.

Overall, QSPELL is a marvel. It is sophisticated, professional, and very fast. Like Quill, QSPELL would benefit from some memory expansion. QSPELL at under \$30 is a must. Be sure to get the version for the U.S.--the British version DOES NOT work with our Quill (or QLWP as it is called).

Quick Look

WORDS NOT FOUND IN QSPELL AS TESTED:

COMMON ERRORS: alluded annulled alumni affidavit aggravate aluminum analyze appropriation assessable bituminous bookkeeping borrower brokerage canceled capitalization cartage collateral commodity community concession considerable consignee contemplating conveyance cooperate corroborate defray disbursements discernible distributor embarrass endeavor foreclosure fundamental hoarse impracticable inasmuch insolvency iteized manila memorandum mercantile middleman misrepresent misstate misspelled moistener mutilage notary notwithstanding obstacle ordinance overdraw pavilion peculiarities pecuniary permissible perpendicular perusal photostat plaintiff plausible precedence prominence promissory prospectus readjustment rebate reconstruction regardless reimburse relations readied remittance representative requisition respectfully respectively ridiculous salutation solvent speculate sublet subsidize suggestion superfluous susceptible syndicate systematize tangible tariff tickler transient treasurer triplicate typographical

DEMONS: aberration aqueous arctic bacillus bassinet bestial bouillon calve cancellation canvass caul cellar chancre clayey cole slow colicky complaisance contractible cornucopia corollary corroborate counselor counsellor covey distensible dyspeptic ebullient ecstasy ephemeral eskimos excel expandable fluorescent fulsome garlicky genealogy harakiri hemorrhage hoeing inoculate isthmus kilos labeled mnemonics picnicking perfectible phlegm rarely receivable referrer sacrilegious sarsaparilla sesede shellacked supersede treadle vendible wrist

SCORES

10	0
	User Friendliness Documentation Flexibility Compatability Lives up to Claims Use of QL Abilities

3 Blank Cartridges Required
0 Blank Cartridges Included
No Runs on U.S. T.V. mode

FINAL SCORE:

9.5



CONTSENRATION

A 2-Player Memory Game For The T/S 1000

by Fred Nachbaur



"CONTSENRATION" is a TS1000 adaptation of the famous card memory game. Two players alternate turning over "cards", looking for a match. When a match is found, the cards are removed and placed in the appropriate player's "pile". Finding a match entitles the player to another turn. The player with the most cards in his pile after all cards have been removed, wins.

The "cards" are actually the letters of the alphabet. There are two of each letter, for a total of 52 cards. It is therefore exactly like playing the game with a standard deck of cards, where you match red or black pairs. When you start the program, you are prompted to enter the players' names (maximum 8 characters). The program then "shuffles" the deck, and lays out the cards in a 4x13 matrix. The players' names are shown below, and a ">" cursor marks whose turn it is. To turn over a card, enter the row (1-4) followed by the column (A-M). For instance, the card in the top left corner is 1A. If you enter an invalid input, it is rejected and the input prompt reappears. If the spot is empty, the program rubs it in and re-prompts.

After turning over the second card, if you have a match the cards are removed and placed next to your name. If no match, you have a few seconds to memorize what is there before the cards are turned over again. When playing with real cards, you can often tell

cards that have been moved because they are put back slightly askew; this program simulates this by showing turned cards as inverse "+" instead of inverse "0". At the end of the game, the winner is indicated.

Believe it or not, this program runs in a 2K TS1000. However, to save space, some of the variables are defined manually. Enter the program lines, then enter the following immediate commands:

```
LET O=0
LET P=1
LET Q=2
LET R=4
LET S=13
LET L=21
LET M=3
DIM B$(4,13)
DIM N$(2,8)
```

Start the program with GOTO 100, or GOTO 50 to SAVE to tape. Do not use RUN or CLEAR!

If you have 16K or more, add line 1 GOTO 100, and put the immediate commands into line numbers 100-109. If this is done, it is OK to use RUN to start the program.

In the listing, lower-case letters represent inverse video. For example, line 450 is inverse 0's separated by normal spaces. Line 700: "@" represents inverse "+". Subroutine 4 is a "blinkless PAUSE". Like PAUSE it can be terminated prematurely with a key-press (as after turning the second card, or during an error message). Enjoy the game!

```

4 FOR A=0 TO L*R
5 IF INKEY$("<")="" THEN RETURN
6 NEXT A
7 RETURN
21 PRINT AT Q*H(B)+P,Q*I(B)+O;
C$
22 RETURN
50 SAVE "CONTSENRATION"
120 LET T=0
130 PRINT AT R,R+R;"contSEnrat
ion",,,, "BY F.NACHBAUR",,,
140 GOSUB R
150 FOR A=P TO Q
160 PRINT "NAME-PLAYER ";A;"?"
170 INPUT N$(A)
180 NEXT A
200 LET A$="ABCDEFGHIJKLMNQPQRS
TUVWXYZ"
210 LET A$=A$+A$
220 FAST
230 FOR A=P TO S*S
240 LET B=INT (RND*S*R+P)
250 LET C=INT (RND*S*R+P)
260 LET C$=A$(B)
270 LET A$(B)=A$(C)
280 LET A$(C)=C$
290 NEXT A
310 FOR A=0 TO M
320 LET B$(A+P)=A$(A+S+P TO )
330 NEXT A
340 LET A$=""
400 CLS
410 DIM S(Q)
420 SLOW
430 PRINT TAB M;"col";TAB R;"A
B C D E F G H I J K L M ","row"
440 FOR A=P TO R
450 PRINT AT A*Q+P,0;" ";A;" 0
0 0 0 0 0 0 0 0 0 0 0 0 0"
470 NEXT A
480 PRINT AT S,Q;N$(P);AT S+M,Q
;N$(Q)
490 DIM H(Q)
500 DIM I(Q)
510 FOR B=P TO Q
520 PRINT AT S+M+T,0;">";AT S+M
*NOT T,0;" ";AT L,0;"ROW/COL ";B
;"=?"
530 INPUT C$
540 IF LEN C$(>Q THEN GOTO VAL
"530"
550 IF C$(P)("<1" OR C$(P))"<4" 0
R C$(Q)("<A" OR C$(Q))"M" THEN GO
TO VAL "530"
560 LET H(B)=VAL C$(P)
570 LET I(B)=CODE C$(Q)-37
580 LET C$=B$(H(B),I(B))
590 IF C$("<" " THEN GOTO VAL "6
30"
600 PRINT AT L,0;"spot empty."
610 GOSUB R
620 GOTO VAL "520"
630 IF H(P)=H(Q) AND I(P)=I(Q)
THEN GOTO VAL "520"
640 GOSUB L
650 NEXT B
660 PRINT AT L,0;A$
670 IF B$(H(P),I(P))=B$(H(Q),I(
Q)) THEN GOTO VAL "760"
680 GOSUB R
690 LET T=NOT T
700 LET C$="2"
710 FOR B=P TO Q
720 GOSUB L
730 NEXT B
740 IF S(P)+S(Q)=S*Q THEN GOTO
VAL "820"
750 GOTO VAL "490"
760 LET S(T+P)=S(T+P)+P
770 PRINT AT S+P+M+T,P+S(T+P);C
HR$ (CODE C$+128)
780 LET C$=""
790 FOR B=P TO Q
795 LET B$(H(B),I(B))=""
800 NEXT B
810 GOTO VAL "710"
820 IF S(P)(>S(Q) THEN PRINT AT
L-Q,0;"winner-";N$(P+(S(Q)>S(P)
))
850 PRINT AT L,0;" GOTO 100 TO
START NEW GAME"
```


TS 1000/1500 PROGRAM CHAINING

Part One

by Earl V. Dunnington

Program Chaining can, in effect, increase your RAM memory many times its actual size. It is one of the most neglected subjects of programming texts and instruction. There was an article published in SYNC, Jan/Feb '84, but it was actually on merging a program on tape with one in the computer, not "Chaining" as defined below. Program Chaining is not just Linking unrelated programs together. Linking can be as simple as saving several programs, by name, on one recording medium with the operator calling the program he wants with the direct LOAD "NAME" command. The programs can be self-running or not. In this case the operator is doing the Linking. Another form of Linking is to have one program load another. This is done simply by inserting as a line in the program, LOAD "PROGRAM NAME". If the program to be loaded is on a different tape, then a prompt and a pause should proceed the load line. For example:

```
100 PRINT "CHANGE TAPE, THEN PRESS A KEY"
110 PAUSE 32767
120 LOAD "TWO"
```

Another common form of Linking is to have a Menu program which automatically loads the chosen self-running program.

To make a program self running, add the line, SAVE "PROGRAM NAME". Unless it is the first line in the program, it must be preceded by a command that will avoid an endless loop and followed by a RUN or eventually if not immediately by a GOTO. For example:

```
9997 STOP
9998 SAVE "TWO"
9999 GOTO 10
```

You have to record the program using the direct command: GOTO 9998

Chaining is a specialized form of program Linking. It is a method of Linking dependent program modules together making them operate, in effect, like one large program, similar to a GOTO, but using LOAD "NAME" instead. If an endless tape were used it might also be considered similar to a GOSUB and RETURN in a program. A dependent module is a program that operates using variables, strings, or text entered into the computer memory by a previous program. Why is there a need to Chain? One reason is to save memory so that more data or text can be stored. Another is that in some practical applications, the program simply becomes too large to fit into the available memory and the program must be broken into separate pieces that will work together as one program.



Subscribers who have read my series of articles "Adventures in the RAM Jungle and Other Mysteries" Sept/Oct '85 through Jan/Feb '86, have already been exposed to two examples of Chained programs with the operator doing the Linking. The first example consisting of the Flypaper program and Program One (Nov/Dec '85). The second example is the two programs Fig. No.3 and No.4 of the Conclusion.

Constant variables present no problem as they can be recorded in each program module. The variables referred to in this article are those computed by a previous module. There are four ways to pass variables, ect., in Chained programs for the T/S 1000 and 1500. The first is the VARS method, the second is the System Variables method, the third is the Safe area method, and the fourth is the above RAMTOP method. The passage of variables, strings, code, or text from one module to another using the VARS or Safe area methods is made possible because the LOAD, RUN, or GOTO commands do not clean the memory like NEW. Data stored above RAMTOP is safe from all of these commands. CLEAR and RUN clean the VARS area of DIM statements, arrays, variables, and strings. To protect data stored in the Safe Area, never use expanding undimensioned strings in a program. For example, DO NOT use:

```
10 LET T$=""
20 FOR N=18000 TO 19000
30 LET T$=T$+CHR$ PEEK N
40 NEXT N
```

In the VARS method, the first module must be the largest. The area in VARS, where the data to be passed is stored in the first

module, must be in the Safe area of the second module. The area in VARS of the second module, where the data is stored, must be in the Safe area of the next module, ect. In other words, the top of the Calculator stack during the program RUN of the succeeding module, must not enter the area occupied by the data in the VARS area of the preceding module. (see Fig. No.1). The position of the area of VARS occupied by the data can be adjusted by enlarging the program using REM or DIM statements.

Passing the text in a string from one module to the next is not difficult. Variables however, are stored in the program and VARS area using a special floating point Sinclair format. Passing a variable in this format is much more complicated. Any good text on Assembly language or Machine Code for T/S computers, covers the Sinclair format for numerical data and is beyond the scope of this article. It is much easier to pass variables by converting them to a string. For example, type the following into the computer and RUN it:

```
10 LET A=12345678912345
```

```
20 LET A$=STR$ A
```

```
30 PRINT A$
```

The result displayed should be:

```
1.2345679E+13
```

If you change line 10 to a negative value the result displayed should be:

```
-1.2345679E+13
```

To convert the string back to a variable add:

```
40 LET A=VAL A$
```

```
50 PRINT A
```

```
and ENTER: GOTO 40
```

Lines 40 and 50 would be in the next module. As you can see, variables with over thirteen digits to the left of the decimal point are converted to the Scientific notation. The same thing applies to strictly decimal values with more than four zeros to the right of the decimal point.

If you want the string to be passed to be the first data in the VARS area, then use a DIM statement for the string before any other assignments are made, including loops. This reserves the space. Normally the string to be passed will be the last data in assignment and a DIM statement is not required. The last character of the string will then be two addresses below E Line if undimensioned or dimensioned with only one dimension, like DIM A\$(14). For string arrays (two or more dimensions), refer to Appendix of your Owner's Manual.

To illustrate a Chained program using the VARS method, ENTER: NEW and type in the following module "ONE"

```
10 LET A=12345678912
```

```
20 DIM X$(900)
```

```
30 LET A$=STR$ A
```

```
40 LOAD "TWO"
```

```
50 SAVE "ONE"
```

```
60 RUN
```

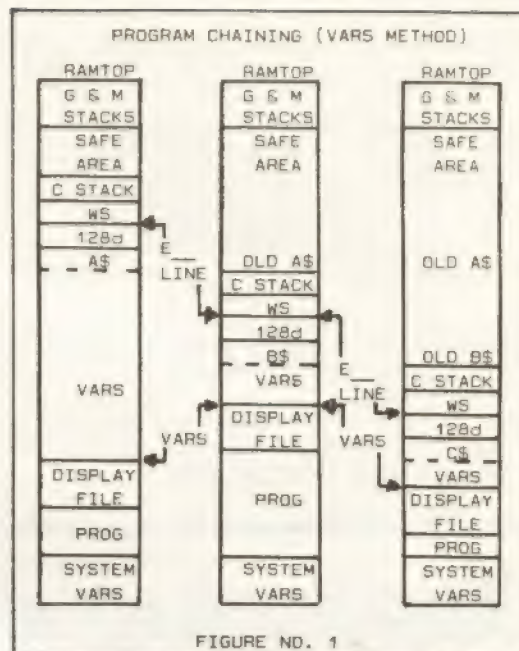


FIGURE NO. 1

Line 10: Assigns a numerical value to the variable A.

Line 20: Makes a large increase in the size of the program by reserving space in the VARS area, raising the address where A\$ will be stored into the Safe Area of the next module. This Safe Area was determined for module "TWO" using the methods described in the referenced RAM Jungle article.

Line 30: Converts the variable A, whose value is to be passed to the next module, into a string with a length of 11 digits. Line 40: Automatically loads the next module and prevents the program from going into an endless save loop.

Lines 50 and 60: Make module "ONE" self-running when saved with a GOTO 50 and loaded with the direct command LOAD "ONE".

Save this program on tape using the direct command GOTO 50. When the diagonal load lines are displayed, stop the tape. Do not rewind the tape as you now have the correct amount of tape from module "ONE" to record module "TWO". Use the BREAK key to return to the programming mode. Find the address of E_Line by entering the direct command:

```
PRINT PEEK 16404+256*PEEK 16405
```

The result should be 18312 (16K RAM) or 17544 (2K RAM). The address of the last character of string A\$ is this value minus two.

Enter NEW and type in module "TWO" as follows:

```
10 DIM A$(11)
```

```
20 LET B=1
```

For 16K RAM

```
30 FOR N=18300 TO 18310
```

For 2K RAM

```
30 FOR N=17532 TO 17542
```

Both RAMs


```

40 LET A$(B)=CHR$ PEEK N
50 LET B=B+1
60 NEXT N
70 LET A=VAL A$
80 PRINT A
90 STOP
100 SAVE "TWO"
110 RUN

```

Line 10: Reserves space in the VARS area of program module "TWO" for the 11 digits of the string.

Line 30: This is the address of the string passed from the VARS area of module "ONE" to the Safe Area of module "TWO".

Line 40: Converts the recovered decimal code to the character and stores it in its proper place in the VARS area of module "TWO".

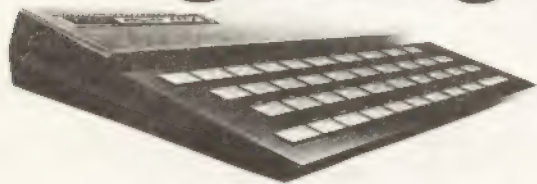
Line 70: Converts the string to a variable. The other program lines are self explanatory.

Save program module "TWO" on the tape using the direct command GOTO 100. When the error report C/70 appears on the screen, stop the recorder. Rewinding the tape. Enter NEW. To operate the chained programs, use the direct command LOAD "ONE". When the diagonal load lines are displayed, start the tape. After module "ONE" loads and runs, diagonal load lines will again be displayed. After module "TWO" loads and runs the value of the variable passed from module "ONE" to module "TWO" will be displayed.

Beginning Z80 Machine Code

Part Two

by Syd Wyncoop



Last issue we discussed Hexidecimal (Hex) numbers and I left you with a machine code (MC) hex loader. You should have noticed that these are very simple programs. That's to allow you to enter and debug them easily, as well as make whatever changes you desire. Please feel free to change them.

We now need to explore the nature of MC. Since you are already familiar with BASIC, I will draw some comparisons. The first difference is that MC does not use program line numbers to tell the CPU (remember him?) in what order to perform tasks. MC instructions are executed in the order in which they occur in memory. Even after a jump (Goto or Gosub), MC continues to execute the instructions sequentially as they are found at the address jumped to.

Secondly, there are about 700 MC instructions for the Z80, as opposed to the 70 or so available in Sinclair BASIC. Don't let this scare you off. All 700 instructions can be placed in about a dozen categories and are, therefore, variations on a theme. We will confine each lesson to one of these categories.

The biggest difference is in how MC "crashes". Crash is a term used to describe the condition resulting from an involuntary exit of the program (i.e., stopping with a full screen error, undefined variable error, ect.). When MC crashes there are no error messages to aid us, due to the fact that we are not operating within the confines of the BASIC interpreter. Often, the only recovery is to pull the power plug and begin again. For this reason, I recommend you always Save your MC prior to execution. Saving it will

not prevent a crash but, it does allow for easier recovery.

There are two things to remember that will help prevent MC crashes. First, you cannot use the Break key to stop your MC routine unless it is reading the keyboard and accepting a Break instruction. (Not likely in most cases.) Second, MC will not stop executing unless it is instructed to do so. MC will continue executing instructions (remember all numbers are instructions), as they are found. The easiest way to solve both problems is to end your routines with a "return to basic" instruction.

We need to determine where we will store our MC, as that is the first prompt in our MC Loader. MC can be stored almost anywhere, although above RAMTOP is best in the T/S 2068, as it can save bytes as Code. RAMTOP is a system variable which tells the BASIC operating system how much memory is available, and more specifically, what is the last available address in RAM. RAMTOP is not necessarily the very end of physical memory, however, for BASIC, it is the top of usable memory. Also, addresses above RAMTOP are unaffected by NEW. Therefore, your routine cannot be erased.

The T/S 1000 presents some special challenges. The best place is still usually above RAMTOP, however, the 1000 cannot Save bytes from high memory. We will therefore store our MC in a REM statement. There are other ways, but this is the easiest to Save and execute for now. Later, we will find that MC can still be most anywhere.

The ease of execution from the first REM statement results from our knowing the exact address at which the MC starts. Looking in the Sinclair manual's section on memory storage, reveals how a BASIC program line is stored:

high low low high

2 bytes	2 bytes		1 byte
Line no.	Length of Text + 1	Text	Enter

The first two bytes are the line number and note they are in direct opposite order of the normal storage of two byte numbers. The next two bytes are stored as the Z80 would normally store numbers and represent the length of the text in the line plus the Enter (which is used by the Basic Interpreter as an "end of line" marker). Next, follow the Basic text and finally the EOL marker. This makes the first byte after REM, the sixth byte in the line and in the program area if the line is the first line of the program. This address is 16514 in the T/S 1000, since the Basic program area begins at 16509. We will insure that we are working with the first line as follows. Type:

1 REM ENTER, POKE 16510,0 ENTER

We have also insured that our first line cannot be Edited even though it will still Save.

The next thing we need to do is make space in our REM statement to hold our MC. Referring to the chart above, the EOL marker is next after REM. We must never overwrite the EOL marker as we will cause an awful nasty crash. Type four lines of spaces after the REM (you can figure how to edit it) and Save your MC loader with your line 0 to avoid retyping it next time. This is very wasteful of memory, but will serve us well for now. Your REM statement need only contain the exact number of bytes you need, when working within a program.

We now need to know how to execute (Run) our MC. This is accomplished with the

USR function. The Sinclair user's manual is a little vague on its use. The proper syntax is:

Command USR X

Where: Command=most Basic commands

USR=USR function

X=address to begin executing from

Examples: RAND USR 16514

PRINT USR 16514

LET A=USR 16514

Boy, this is sure good stuff but, "I ain't written no MC program yet!" Well hang in there, we will get to the actual instructions next issue. Right now though, how about a "sneak preview"?

You may have heard of such terms as opcodes, mnemonics, assembly and disassembly. Opcode is short for Operation Code, and is the Hex numbers we will be entering. They could just as easily be represented in decimal or binary, however, we have chosen Hex.

Mnemonics are another shorthand which has been designed especially for us humans. The CPU understands a long list of numbers (opcodes), however, I don't. I do understand mnemonics as they are almost English (I did say "almost"). Look at the sample disassembly below to see what I mean.

Assembly is what we will be doing when we convert our MC programs to Hex. We will be "assembling" our MC. Assembly Language is another term for MC, and is usually used to refer to the Opcodes.

Disassembly is the opposite of assembly and is usually used to refer to a "listing" of MC instructions. You will probably want to disassemble someone else's MC after you understand what the Opcodes mean. That can help your understanding of MC, as you will already know what the program does. You will be able to see how the task at hand was accomplished. As in BASIC...there is no "single best way" to program in MC. We all develop our own style (or lack of it).

I will end this lesson with a sample disassembly (the one we previously referred to). May we soon know what it means.

Address	Label	Opcodes	Mnemonics	Comments
16514	start	3E0A	Ld A,0Ah	;Put 0Ah in A register
16516		0610	Ld B,10h	;Put 10h in B register
16518		80	Add A,B	;Add 0Ah & 10h and place
16519		4F	Ld C,A	;result in BC register
16520		0600	Ld B,0	
16522	done	C9	Ret	;Return to Basic

Time
Delcni™
MAGAZINE

WHAT'S COMING UP?

JULY/AUGUST 86

- * Nationally-known Sinclair expert/writer, Wes Brzozowski, joins TDM for a series of articles on a 2068 memory bank-switching system. The series is called, "Mystery of the Missing 253".
- * Excerpts from the book "Highfalutin' Computin'" by Bob Orrfelt, will premier as a regular feature in TDM. Bob's book covers a variety of ZX81 and TS1000 topics.
- * Two super 2068 graphics programs: UDG's by Paul Bingham, and POLY-SCROLL by S.D. Lemke
- * All our regular stuff too.

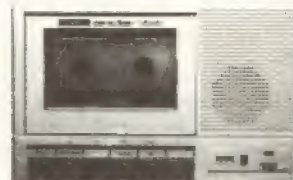


Line 500- Allows input of Directory title. NOTE: CHR\$ 255 is
510 marker for end of title.
Line 600- Loads a Saved Directory from tape.
605
Line 610- Prints compiled Directory to screen/printer. Lines
610-630 searches string for title.
Line 9000- Compiles machine code into memory. Then deletes
9989 itself before saving and verifying program.
Line 9990 Subroutine to handle "Tape Loading" errors.
Line 9998 Autostarts and loads machine code from tape.
Line 9999 Saves and verifies program.

VARIABLES

a\$ = Stores translated header information
b\$ = String to hold compiled Directory
c\$ = DIM'ed to hold b\$ for saving to tape
k\$ = Receives keyboard input
n\$ = Receives name to be saved or loaded by
z\$ = Contains code = BRIGHT 1 & BRIGHT 0

ix = Points to RAM containing header data read from tape
k = Length of b\$ containing title of directory.
print = Printer switch flag
s = Holds possible autostart from header data
t = Holds type # from header data



The author will provide a copy of this program on tape for \$4.00 (includes shipping). Please send a check or money order to: Michael Carver, 1016 NE Tillamook, Portland, OR 97212. Also available are T/S 2068 or T/S 1000 tapes for PABLO PIXEL-O (see Sept/Oct 1985 Time Designs). Price: \$4.00 each or \$6.00 for both 2068 and 1000 versions. Please specify program and computer.

LISTING 1

```
1 REM *****
  Cassette Directory
  1986 Michael E. Carver
  *****

10 ON ERR GO TO 100: CLS : GO
SUB 500: LET z$=CHR$ 19+CHR$ 1
+CHR$ 19+CHR$ 0: CLS : IF print
THEN PRINT #3;"Directory of "
; b$ ( TO k ) "
15 CLS : ON ERR GO TO 100: PR
INT PAPER 21: AT 2,1;"BREAK/CAPS
will return to MENU"; PAPER 1;
#11;"Start tape, then press any
key.": GO SUB 400: CLS
20 RANDOMIZE USR 65451: LET ix
=65475: LET t=PEEK (ix+1): LET
a$=z$ ( TO 2 )+"BASIC" AND NOT
t)+("Array" AND (t=1 OR t=2))+
("Code" AND t=3)+": "+z$ (3 TO )+
" "
30 FOR n=ix+2 TO ix+11: LET a$
=a$+CHR$ (PEEK n): NEXT n: LET
a$=a$+" "+z$ ( TO 2 )+"Bytes: "+z$
(3 TO )+" "+STR$ (PEEK (ix+12)+
256*PEEK (ix+13))
40 LET s=(PEEK (ix+14)+256*PEE
K (ix+15)): LET a$=a$+CHR$ 13+"
"+z$ ( TO 2 )+"Loads at "+z$ (
3 TO )+" "+STR$ s AND t=3)+z$ (
TO 2 )+"Autostart at "+z$ (3 TO
)+ " "+STR$ s AND (NOT t AND s<=
9999))
50 IF NOT t AND s>9999 THEN L
ET a$=a$+z$ ( TO 2 )+"No Autostar
t "+z$ (3 TO )
60 IF (t=1 OR t=2) THEN LET a
$=a$+z$ ( TO 2 )+"Variable "+z$ (3
TO )+" "+CHR$ (PEEK (ix+15)-(32
AND t=1)-(96 AND t=2))+(" " AN
D t=2)+"(")
70 POKE 23692,0: PRINT a$"": L
ET b$=b$+a$+CHR$ 13+CHR$ 13: IF
print THEN PRINT #3;a$""
80 GO TO 20
100 PAPER 1: INK 7: BORDER 1: C
LS : PRINT AT 2,6; BRIGHT 1;"CA
SSETTE DIRECTORY"
110 PRINT AT 8,0;"CREATE DIRECT
ORY.....1""PRINTER
SWITCH.....2""SAV
E TO TAPE.....3""
""CONTINUE DIRECTORY.....
..4""LOAD FROM TAPE.....
.....5""REVIEW DIRECTORY...
.....6"
120 GO SUB 400: ON ERR RESET
130 GO TO 120-(110 AND k$="1")+
(80 AND k$="2")+(180 AND k$="3"
)-(105 AND k$="4")+(480 AND k$=
"5")+(490 AND k$="6")
```

```
200 ON ERR GO TO 100: CLS : PR
INT BRIGHT 11: AT 1,8;"PRINTER S
WITCH"
210 PRINT AT 5,10;"PRINTER "; F
LASH 1; ("ON " AND print); ("OFF
" AND NOT print); FLASH 01: AT 20
,0;"Press "P" to toggle switc
h"; TAB 6;"M" for Menu"
220 GO SUB 400
230 IF k$="p" OR k$="P" THEN L
ET print=NOT print: GO TO 210
240 GO TO 220-(120 AND (k$="m"
OR k$="M"))
300 ON ERR GO TO 100: CLS : PR
INT ""Ready to save Directory:
"
310 PRINT " "i BRIGHT 1;b$ (
TO k); BRIGHT 0;"to tape."
320 INPUT "Save as? "in$: IF LE
N n$>10 THEN LET n$=n$ ( TO 10)
330 DIM c$(LEN b$): LET c$=b$:
PRINT ""Saving ""in$;""": SA
VE n$ DATA c$()
340 PRINT #1;"Verify (y or n)?"
: GO SUB 400
350 IF k$="n" OR k$="N" THEN G
O TO 100
360 INPUT INKEY$: PRINT ""Veri
fying ""in$;""": "Rewind tap
e"; #11;"Start tape, then press a
ny key.": GO SUB 400: INPUT INK
EY$: ON ERR GO TO 9990: VERIFY
n$ DATA c$(): GO TO 100
400 IF INKEY$<>"" THEN GO TO 4
00
410 IF INKEY$="" THEN GO TO 41
0
420 LET k$=INKEY$: RETURN
500 INPUT "Tape name? "jk$: LET
a$=k$: INPUT "Side? "jks: LET
a$=a$+" Side "+jks: LET b$=a$+CH
R$ 255: LET k=LEN b$-1
510 RETURN
600 POKE 23692,23: CLS : ON ERR
GO TO 100: INPUT "Load name?
"in$: PRINT ""Loading ""in$;
"""; #11;"Start tape, then press
any key.": GO SUB 400: INPUT IN
KEY$: IF LEN n$>10 THEN LET n$
=n$ ( TO 10)
605 ON ERR GO TO 9990: LOAD n$
DATA c$(): LET b$=c$
610 ON ERR GO TO 100: CLS : FO
R j=1 TO LEN b$: IF b$(j)=CHR$
255 THEN GO TO 630
620 NEXT j
630 LET k=j-1
640 IF print THEN PRINT #3;"Di
rectory of "b$ ( TO k); "b$(k+
2 TO )
650 PRINT "Directory of "b$ ( T
O k); "b$(k+2 TO )
```

```
660 PRINT #1;"Press ""M"" for M
ENU"
670 GO SUB 400
680 IF k$<>"M" AND k$<>"m" THEN
GO TO 670
690 GO TO 100
9000 CLEAR 65252: LET a$="F33E01
D3F4DBFFC8FFD3FF21E50011E58001C
600EDB0AFD3FFD3F4FB21E58011E5FE
01C600EDB0C9"
9010 GO SUB 9100: IF LEN a$<80
OR check<>4735 THEN PRINT FLA
SH 1;"Error in a$ Line 9000 ---
-- Please Correct": STOP
9020 LET address=65451: GO SUB 9
110: RANDOMIZE USR 65451
9030 DATA 14,15,7,15,10,47,11,14
: RESTORE 9030: LET data=0: FOR
x=1 TO 8: READ y: LET data=dat
a+y: NEXT x: IF data<>133 THEN
PRINT FLASH 1;"Error in Line
9030 ---- Please Correc
t": STOP
9040 RESTORE 9030: LET address=6
5286: POKE address,254: FOR x=1
TO 8: READ y: LET address=adr
ess+y: POKE address,255: NEXT x
9050 LET a$="AF3700DD21C3FF11150
00BCDFFFE2AC3FF7DFE00C8C3ABFF"
9060 GO SUB 9100: IF LEN a$<48
OR check<>2887 THEN PRINT FLA
SH 1;"Error in a$ Line 9040 ---
-- Please Correct": STOP
9070 LET address=65451: GO SUB 9
110
9080 GO TO 9988
9100 LET check=0: FOR x=1 TO LEN
a$: LET check=check+CODE a$(x)
: NEXT x: RETURN
9110 FOR x=1 TO LEN a$-1 STEP 2:
POKE address+INT ((x-1)/2), (CO
DE a$(x)-(48 AND CODE a$(x)<58)
-(55 AND CODE a$(x)>64))*16+COD
E a$(x+1)-(48 AND CODE a$(x+1)<
58)-(55 AND CODE a$(x+1)>64): N
EXT x: RETURN
9988 CLEAR : DELETE 9000,9988
9989 GO TO 9999
9990 ON ERR GO TO 100: CLS : PR
INT FLASH 1; AT 5,8;"Tape Loadi
ng Error"; FLASH 0;"TAB 8;"Pl
ease Attempt Again"; #11;"Press a
ny key for Menu": GO SUB 400: G
O TO 100
9998 CLEAR 65252: LOAD "director
y" CODE 65253: LET print=0: GO T
O 100
9999 CLS : PRINT "Saving directo
ry": SAVE "directory" LINE 9998
: SAVE "directory" CODE 65253,22
2: CLS : PRINT "Ready to Verify
-- Please RewindTape -- Start
Tape and Press anyKey": GO SUB
400: CLEAR : VERIFY "directory"
: VERIFY "directory" CODE : LET
print=0: GO TO 100
```


LISTING 2

ADDRESS	OP CODE	MNEMONICS	NOTES
FFAB	F3	DI	
FFAC	3E01	LD A,01	
FFAE	D3F4	OUT (F4),A;	Activate chunk 0 of DOCK bank DKHSPT
FFB0	DBFF	IN A,(FF)	
FFB2	CBFF	SET 7,A	
FFB4	D3FF	OUT (FF),A;	Select EXROM
FFB6	21E500	LD HL,00E5;	Move from address 00E5 of EXROM
FFB9	11E580	LD DE,80E5;	Move to address 80E5 in RAM
FFBC	01C600	LD BC,00C6;	Move C6 bytes (count)
FFBF	EDB0	LDIR ;	Execute move and decrement count
FFC1	AF	XOR A	
FFC2	D3FF	OUT (FF),A;	Select Home ROM
FFC4	D3F4	OUT (FF),A;	De-Activate DOCK bank
FFC6	FB	EI	
FFC7	21E580	LD HL,80E5;	Move from address 80E5
FFCA	11E5FE	LD DE,FEE5;	Move to address FEE5
FFCD	01C600	LD BC,00C6;	Move C6 bytes (count)
FFD0	EDB0	LDIR ;	Execute move and decrement count
FFD2	C9	RET	

LISTING 3

ADDRESS	OP CODE	MNEMONICS	NOTES
FFAB	AF	XOR A ;	A = 0 & Reset flags -Read header
FFAC	37	SCF ;	Load not Verify
FFAD	00	NOP ;	Room for Bonus One
FFAE	DD21C3FF	LD IX,FFC3;	Read to address FFC3
FFB2	111500	LD DE,0015;	Read 15h bytes
FFB5	0B	EX AF,AF ;	Required by R_Tape
FFB6	CDFFFE	CALL FEFF ;	"Gosub" R_Tape + 3
FFB9	2AC3FF	LD HL,(FFC3)	
FFBC	7D	LD A,L	
FFBD	FE00	CP 00 ;	Was data header?
FFBF	C8	RET Z ;	Return if header data
FFC0	C3ABFF	JP FFAB ;	Try again if not

LISTING 4a

ADDRESS	OP CODE	MNEMONICS	NOTES
FFAB	37	SCF ;	Load not Verify
FFAC	3EFF	LD A,FF ;	Read Data
FFAE	DD21	LD IX, ;	Read to address
FFB2	11	LD DE, ;	Read bytes
FFB5	00	NOP ;	Overwrite
FFB6	CDFCFE	CALL FEFC ;	Gosub R_Tape
FFB9	C9	RET ;	Done

Listing 4

NOTE: After typing in program, enter as direct command <GO TO 8>. This will save program and code and will auto-start after re-loading.

```

1 DEF FN l(x)=x-256*INT (x/256)
61: DEF FN h(x)=INT (x/256)
2 ON ERR RESET : INPUT "Load
to "add: INPUT "# of bytes ":
len: IF len+add>=VAL "65253" TH
EN PRINT "Too many bytes -- re
-enter": GO TO 2
3 POKE VAL "65451",VAL "55":
POKE VAL "65452",VAL "62": POKE
VAL "65453",VAL "255": POKE VA
L "65461",NOT PI: POKE VAL "654
63",VAL "252": POKE VAL "65465"
,VAL "201": POKE VAL "65456",FN
l(add): POKE VAL "65457",FN h(
add): POKE VAL "65459",FN l(len
): POKE VAL "65460",FN h(len)
4 ON ERR GO TO 6: CLEAR (add
-PI/PI): CLS : PRINT "play tape
": RANDOMIZE USR VAL "65451"
5 ON ERR RESET : STOP
6 PRINT "Address to low -- re
-enter": GO TO 2
7 LOAD "loader"CODE : GO TO 1

8 SAVE "loader" LINE 7: SAVE
"loader"CODE 65253,222

```

LISTING 5

NOTE: To use program Enter <RUN>

```

9015 LET a$(25 TO 26)="00": LET
a$(31 TO 32)="00": LET a$(37 TO
40)="0020": LET a$(57 TO 58)="
C9": LET a$a$( TO 58): LET add
ress=65451: GO SUB 9110
9020 CLEAR 32767: RANDOMIZE USR
65451: GO TO 9999
9999 SAVE "exrom"CODE 32768,8192
: PRINT "rewind tape to verify"
: VERIFY "exrom"CODE 32768,8192

```

All Caps, Please!!!

by Earl V. Dunnington

There have been many good programs published for the 2068 that I would have copied except for the fact that lower case was used. This combined with reduced reproduction, illegibility, and only fair eyesight presents too much of a problem, and I do not think that I am alone in this. The 2068 has a Caps-Lock key, and I use it when programming.

There is an added benefit to using all caps in that you can save memory by avoiding

double IF statements such as:

```
IF a$="Y" OR a$="y" THEN GOTO 10
```

To do this you must insert a line into the program to poke the system variable FLAGS2 as follows:

```
POKE 23658,8
```

This prevents the use of lower case, which can be restored by:

```
POKE 23658,0
```

If you will copy the following program, save it on tape, merge it with a program to be listed for publication, run it using GOTO 9910, it will change all lower case characters to upper case, except for double IF statements. You must of course delete these added lines before LListing your program.

```

9910 LET A=PEEK 23635+256*PEEK 23636
9920 LET E=PEEK 23627+256*PEEK 23628
9930 FOR N=A+5 TO E
9940 IF PEEK N=36 OR PEEK N=166 AND PEEK (N+5)=197 THEN LET N=N+13
9950 IF PEEK N=14 THEN LET N=N+6
9960 IF PEEK N=13 THEN LET N=N+5
9970 IF PEEK N>=97 AND PEEK N<=122 THEN POKE N,PEEK N-32
9980 NEXT N
9985 STOP
9990 SAVE "ALL CAPS" LINE 9910

```


Machine Language Program To Read T/S 2068 Tape Headers

by Ed Shaughnessy

The T/S 2068 program presented here reads the header of a program or code that is stored on tape, and tells what command was used to save it. Suppose you have a BASIC program on tape that was saved for automatic start. This program will tell you at what line number the program will begin execution when it is loaded. Or suppose, you have a machine language routine on tape. This program will tell you its length and what location it was saved from. In each case, the information is shown by displaying the complete command that was used when the SAVE was done.

When the BASIC program shown in the listing is run for the first time, it saves itself and then saves machine language code it has created. You can then rewind the tape, and run the program so it will read the headers of its own two backups. In this way, the program demonstrates itself.

Let's look at the program. Line 20 calls the subroutine that POKE's the machine language program into RAM. Line 40 saves the BASIC program. Notice that it is saved so that it will automatically start at line 90 when it is loaded. Line 60 saves the machine language code. Line 110 and 120 will repeatedly execute the ML program that finds and reads header information. At this point, when you are running the program for the first time, rewind the tape and press the play button. Press any key to continue execution of the ML program. Soon you will see the familiar loading pattern on your screen. Eventually the following will be displayed:

SAVE "HEADER" LINE 90

SAVE "HEADER"CODE 40000,176

Compare these lines with lines 40 and 60 in the program, the two lines that did the saves. Press BREAK to terminate or the program will continue to search for another header.

You now have two versions of the program on tape; the BASIC program and the ML program. In the future, the quickest way to investigate a tape is to load just the ML program.

LOAD "HEADER" CODE

Since you are not specifying any location or length, it will be loaded into the location it was saved from. Execute the machine language code.

RANDOMIZE USR 40000

A message will prompt you to start playing the tape that contains the program you wish to investigate. Then press any key so the ML routine will continue execution. The program will read the tape until it finds the first header. It will display the command that was used to do the SAVE and then it will terminate. The 17 bytes of the header area will be in a workspace in RAM, starting at location 40200. You may examine this area with HOT Z or PEEK into it with a BASIC program.

Page 237 of the T/S 2068 User's Manual shows the different formats of the SAVE command. Notice on page 238, that the result SAVE filename CODE 16384,6912 was actually accomplished with the command SAVE filename SCREEN\$. For a detailed explanation of what information is contained in the tape header, see P.H. Skipper's article in Vol.3 No.2 issue of SyncWare News.

As long as your computer is in T/S 2068 mode, you can use this program to read Spectrum tapes as well as 2068 tapes. If you have the SOFTAD tape, try that. If you encounter strange results, it is due to copy protection schemes. To search through an entire tape, you may find it more convenient to load the BASIC program, since it will continue reading successive headers on a tape until you press BREAK.

```
10 REM THIS TS2068 PROGRAM CRE
ATES AN ML ROUTINE TO READ TAPE
HEADERS. IT WILL READ A TAPE CON
TAINING A PROGRAM OR CODE AND TE
LL WHICH FORMAT OF THE "SAVE" CO
MMAND (PAGE 237 OF THE USER'S MA
NUAL) WAS USED.
```

```
20 GO SUB 200
30 PRINT "Prepare to save BASI
C program"
40 SAVE "HEADER" LINE 90
50 CLS : PRINT "Prepare to sa
e ML code"
60 SAVE "HEADER"CODE 40000,176
70 CLS : PRINT "Rewind the tap
e and press PLAY."
```

```
80 GO TO 100
90 CLS : GO SUB 200
100 PRINT " (Press BREAK when
finished)"
```

```
110 RANDOMIZE USR 40000 : PRINT
120 RANDOMIZE USR 40014 : PRINT
GO TO 120
```

```
200 LET CSUM=0
210 FOR I=40000 TO 40176
220 READ X: POKE I,X: LET CSUM=
CSUM+X
```

```
230 NEXT I
240 DATA 62,253,205,43,16,17,13
7,60,205,63
```

```
250 DATA 7,205,217,17,219,255,2
03,255,211,255
```

```
260 DATA 219,244,50,153,62,62,1
,211,244,221
```

```
270 DATA 33,6,157,221,229,17,17
,0,175,55
```

```
280 DATA 205,252,0,221,223,43,2
42,58,195,92
```

```
290 DATA 211,244,219,255,203,19
1,211,255,62,254
```

```
300 DATA 205,40,15,221,229,223
125,254,0,40
```

```
310 DATA 14,254,3,40,27,17,166
60,205,63
```

```
320 DATA 7,205,193,153,201,205
183,156,126,230
```

```
330 DATA 192,192,62,32,215,17,1
3,1,205,215
```

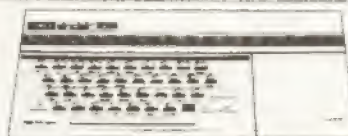
Program Continued Next Page...


```

0300 DETH 0204 175 000 000 00 7 0
0300 0300 0400 0200 195 001 70 4 0
7000 0000 0000 0000 000 000 00 0 0
0400 DETH 0000 001 400 000 00 0 0 0
0200 IF 0000 0000 001 400 000 00 0 0
E 0000 IF DETH 0000 0000 000 00 0 0
0300 RETURN

```

by Charles Eric Govette

[illegible]

[illegible]

ADDING A JOYSTICK FOR THE SPECTRUM/2068

by Jack Keene

Having converted your 2068 to Spectrum mode of operation, you will find that most British software can be operated successfully from the keyboard, but a joystick might make life a little easier. While the joystick ports may be successfully accessed by the appropriate IN commands, this is of little use for commercial software.

A variety of joystick conventions are used with the Spectrum, and many programs offer the choice of several. The cursor key interface uses the cursor key lines + 0 for fire. The Sinclair Interface uses 6, 7, 8, 9 and 0. However, the most common interface encountered is the Kempston style interface (Kempston is the trademark of Kempston Electronics).

The Kempston protocol interface is addressed to port 31 and may be accessed from BASIC via IN 31. The following simple program--10 PRINT IN 31:: GO TO 10--will return

the following values for the appropriate joystick direction:

```
RIGHT = 1          UP/RIGHT = 9
LEFT = 2           UP/LEFT = 10
DOWN = 4           DOWN/RIGHT = 5
UP = 8             DOWN/LEFT = 6
```

FIRE ADDS 16 TO ALL VALUES

This type interface may be constructed with a simple one chip circuit to plug in at the rear expansion connector, the cartridge port, or even wired in directly. Due to simplistic decoding (A5 and IORQ), this device will respond to more than port 31. However, this works well with most other peripheral devices.

If you are so inclined, the schematic in Fig.1 illustrates the interface from the wiring side view with the appropriate connection to the expansion connector labeled. An expansion connector layout for the 2068 is included for your reference.

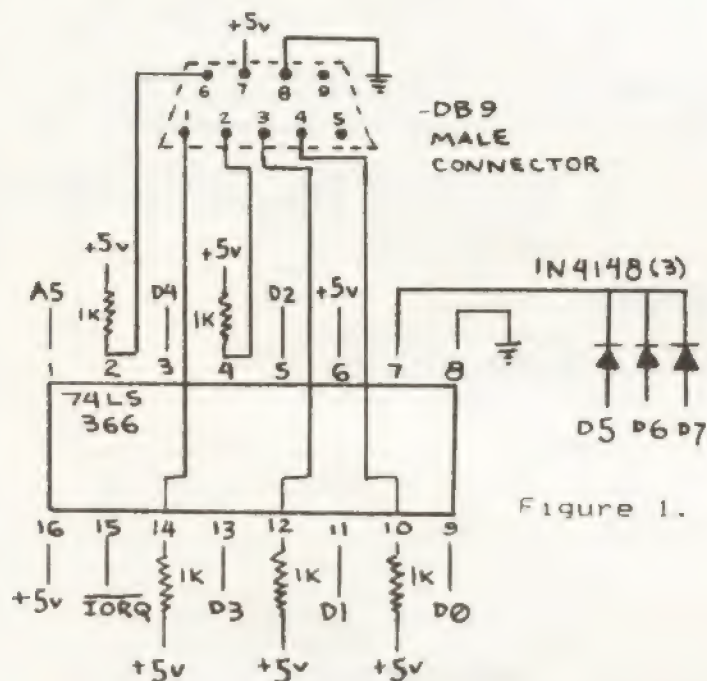


Figure 1.

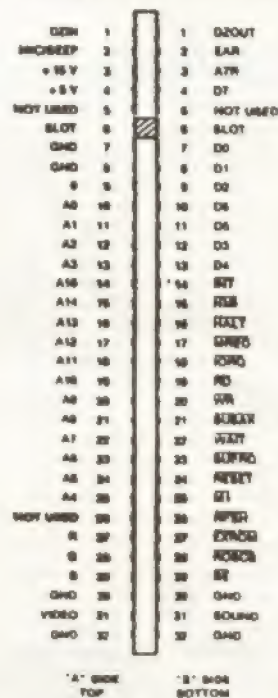


Figure 2.

Adapting The TI Keyboard To The 2068 by Richard Hurd

I feel that as 2068 users, we have been supported very well, considering our fate. But still, I have longed for a professional keyboard...I decided to adapt one myself. I hope these notes will help anyone else wanting the same.

This project is relatively easy, just time consuming. For myself, the results were well worth the time invested.

Please note that there is an increased amount of interference if you are using a color television. Whenever a key

is pressed, it is similar to when PAUSE is on. This might be compensated by using a shielded cable (13 strands...I don't know of any suppliers for this). I use a green screen monitor, and do not have this interference problem.

I purchased the Texas Instrument 994A keyboard from: Arnold Company, 214 Hill Lane, Red Oak, TX 75154 (214) 576-2291 for a total of \$10.89 C.O.D. It came with two reprints of articles on adapting the TI keyboard to the T/S 1000, which had some good ideas on wiring.

Continued Next Page...

WIRING THE TI KEYBOARD:

I cut all traces just where they attach each pin. Two color, 24 gauge, stranded wire works well and it helps to keep the individual connections in order. A low-wattage soldering iron, Radio Shack's five piece set worked well for the project. Watch for solder bridges. Any bare wires should be taped to prevent shorts in the matrix. Take your time. Follow Fig.1 for the wire connections.

EXTRA KEYS:

There are six extra keys on the TI keyboard, not found on the 2068. I removed five of them using de-soldering braid (I used less than a foot of braid). I decided to re-arrange the extra keys as a set of CURSOR keys. A welcome addition. I ran wire jumpers from the TI keyboard to connect them. Note: I left one of the extra keys on. I have plans to convert it to a single key delete (I haven't done this yet). Any suggestions?

MAKING THE CONNECTION:

I used an 18" piece of ribbon cable, stripped-down to 13 strands to make the connection. Fig.2 shows where the short ribbon cable from the 2068 keyboard attaches to the 2068 PC board. The ribbon cable that has been added to the TI, attaches to the other end, at the original keyboard connection. It is also a good idea to unplug the short ribbon cable from the PC board when tacking on the new one. I removed my 2068 keyboard and disassembled it to find the wiring matrix (I never re-installed it).

Plug the ribbon cable back in and test your new keyboard. Any problems? If so, power down and check your soldering connections.

THE CASE:

I used a piece of 1/2" plywood (17 1/4" x 6"), cut out and routed to fit the TI keyboard. The holes for the CURSOR keys were drilled. The Cursor keys are held in place with a small amount of EPOXY glue. They have held up well. I hot-glued small pieces of plywood to the sides of the plywood top, making it a case. I also covered the case with contact paper, matching the color of the monitor. I built an open ended, open bottom cover with cutouts for peripherals, that sits on top of the 2068, and my monitor on top of that. You can use just about any materials to build your case. I would like to suggest that you use what you are familiar with. The extra length of my Case, is because I also added the HI-TEK 18-key-pad. The keypad is also from Arnold Company. It is priced at \$6.95. It is also just jumpered wired to the TI keyboard. I would also like to mention that RMG Enterprises (1419 1/2 7th St., Oregon City, OR 97045) has replacement key labels for the 2068. If you run into any problems, drop me a S.A.S.E at P.O. Box 153, Warrenton, OR 97146). I'll try to help all I can.

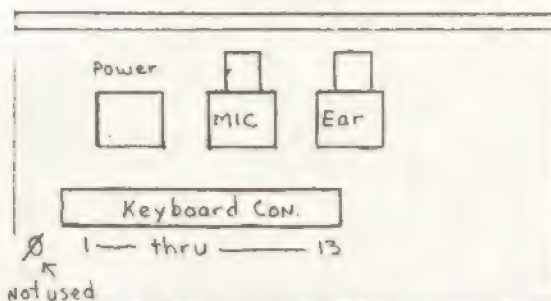


Fig. 2

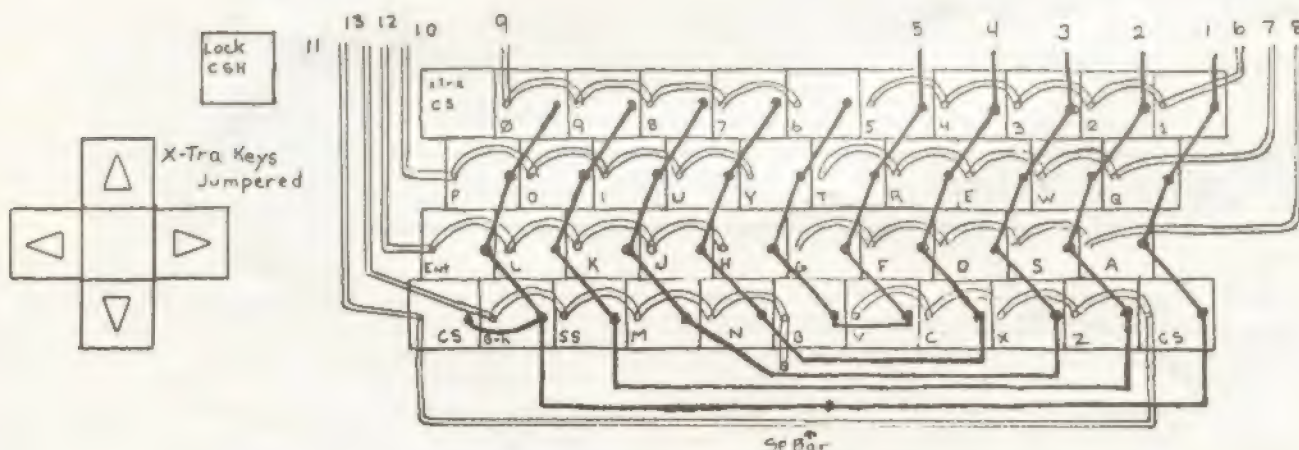


Fig. 1

More On The Oliger Disc Interface

by Dick Wagner

My article on the Oliger 2068 Floppy Disc Interface in the March/April 86 issue, had an error that should be corrected. The next to last paragraph incorrectly stated the number of K bytes that an Amdek 3" disk will store. John Oliger set me straight on this.

The number of bytes the system will store per side (single side, double density) is 195.5K. As mentioned in my review, a side will store 4 regular files plus 1 special file, 0. Correctly, a single file is always 48.5 kbytes, and the special file is about 1.5 kbytes. This comes about by the manner in which the system operates and not by limits in the disc system.

John Oliger also has provided an explanation of "tracks" as used in a disc system. A track is a stopping place or the position of the head. Thus my Amdek drive is defined as a 40 track system (1 disc side). This is a little different from my understanding of the specifications provided with the drive,

which indicates it has 80 tracks.

John's SAFE system has been used extensively since the review was written. There has been no problems with it other than I damaged the special controller IC by zapping it with static electricity. There have been updates and revisions, and I am ordering a new EPROM that will provide a MOVE, to copy a disc from one drive to another, MOVE n to m to copy a file from one disc to another, and VERIFY. I have not implemented his fantastic SAVE system, but will do so very shortly. This will SAVE any program that will load into the computer! Just a press of a switch button. No LOAD command is used.

My apology to John, and I hope any reader turned off by my error will re-read my report plus others that are being printed. At least send for John's literature and quotes. (Write to: The John Oliger Company, 11601 Whidbey Dr., Cumberland, IN 46229)

SOFTWARE IN REVIEW

EXTENSIONS

Reviewed by Dennis Silvestri

How do you improve a great product? Easy, make it even better. That is exactly what Robert Fischer did with Tom Woods's Pro/File 2068. It is called "Extensions". Extensions are three separate newsletters in which the user types in the improvements to Pro/File 2068. My review is a combined listing of all three Extension issues.

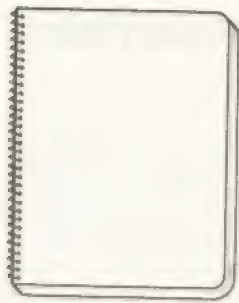
A big feature is the use of variables using the VAL and CODE function which will save approximately 2000 plus bytes. There is an improved Save-Verify function, as well as an improvement on making a back-up master. You can save everything as well as the MC, so you do not need a separate Master Tape to load in first, or you can save the Basic with data just as it is done on the original Pro/File 2068, or you can save just the data itself. There is also a more compact display and edit menu, allowing more commands to be seen at one time on one screen.

There is a cursor wrap feature which I found extremely convenient. There are improvements to the Machine Code sort routine

and the tally function. There is even a function that allows you to transfer Extensions improvements to any existing Pro/File data you may have. Extensions also has a routine to make it Spectrum and Microdrive compatible. There are more improvements that I have not listed. In order to get the full benefits of Extensions you should have all three issues.

Keep in mind that you do need Pro/File 2068, and the machine code sort routine from Tom Woods Breakthrough Newsletter before inputting the Extensions/improvements. Each issue of Extensions is \$6.00 each and can be ordered from Robert C. Fischer, 221 Scoggins St., Summerville, GA 30747. There is also a version of all three Extension issues on tape, which can be merged with Pro/File 2068. It is called Pro/File Plus Three, and it costs \$18.00.

With all the improvements offered by Extensions, you will still have all the capacity of the original Pro/File 2068 for your files.



Address Book

Reviewed by Duncan Teague

Address Book
Zebra Systems, Inc.
78-06 Jamaica Avenue
Woodhaven, NY 11421
T/S 2048: \$9.95

Why should you buy a dedicated name, address, and telephone number file manager when there are several general purpose programs available to accomplish the same task? Does it have any special features that make it worthy of your ten bucks? Read on and find out the answers to these and other burning questions.

"Address Book" has been developed by Mark Fendrick. Mr. Fendrick is a columnist for at least publications, including ZX Computing and The Computer Shopper.

The above fact does not give him instant credibility as a software developer. It does, however, offer a rare chance at an objective look at a program written by an individual who regularly writes critical reviews of others' software creations.

I'll quote a comment from Fendrick's review of two programs in the January issue of The Computer Shopper.

"...neither of these two programs is extraordinary in and of itself."

What's ironic about this comment is that one of the programs Fendrick is evaluating is a mailing list/address book program that offers more features than his own.

Address Book first announces that you have the opportunity to load the machine code portion of your Aerco interface driver. If you don't have an Aerco Interface, then you may still use the T/S 2040 printer. I do, I did, and it works. I did have to make some modifications to adapt the printer codes to my Prowriter.

Data is entered into 6 fields: 1. Name, 2. Address, 3. City and State, 4. Zip Code, 5. Area Code, and 6. Telephone Number.

Sorting may be done by name, by zip, or by area code. My only criticism is that "name" should have been split into two fields, a first name field and a last name field. As the program is written, data must be entered as "last name, first name" for an alphabetical listing to be useful.

The record and file handling chores are handled with ease. A record can be deleted or edited. When editing, a press of the ENTER key skips a field in which no change is to be made. The file can be searched to find a specific record. The search word does not have to be an exact match. The search routine finds the first record that starts with the characters entered.

Either a screen listing or a hard copy printout of the file is available. These two options can be started at the beginning or at any point in the middle of the file. The hard copy can easily be formatted for the printing of mailing labels. Telephone numbers can be printed or omitted as desired. The number of line feeds required between forms is also specified with this option.

The program continuously reports how many records may still be added to the file. The screen information, however, doesn't agree with the documentation. While this is a minor flaw, there are some more serious, but correctable, programming flaws.

The FOR...NEXT loop in which the number of line feeds between forms is specified is programmed incorrectly. One more line feed than the user specifies is sent to the printer. One printer code in the program actually calls for a form feed from my Prowriter, instead of a line feed. Another problem, a little harder to trace, is in the screen listing of the file.

After entering several records, if you request a screen listing of the file, the program returns to the menu. This is an ever-present annoyance caused by an ON ERR statement that sends the program back to the menu whenever any error situation is encountered. The error in this routine is an undefined variable. The variable Z\$ is defined in the hard copy routine but not in the screen listing routine. Adding the line: 2014 LET Z\$ = ES fixes the problem.

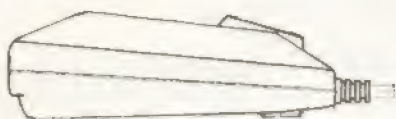
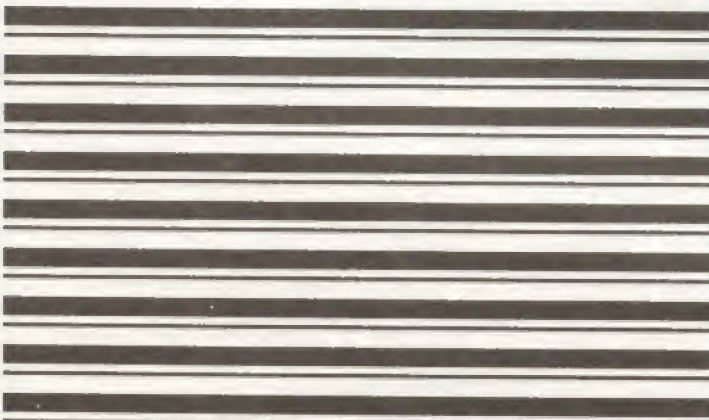
The folks at Zebra Systems, Inc., who are distributing this program for Mark Fendrick, have left themselves (and us) a safety valve whereby the program may be stopped (for tracing program errors, no doubt). At the main menu, typing "1" causes the string input prompt to be displayed in the editing area. Typing "zebra" at this input prompt executes an ON ERR RESET command and then STOPS the program. Neat, huh?

Unfortunately, that is the cleverest part of this program. A general database will accomplish the same tasks, with greater speed, and with more flexibility. Don't waste your time with single purpose programs unless they offer some extraordinary features. Address Book does not.

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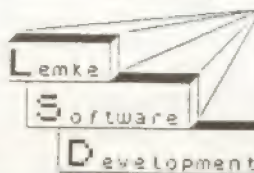
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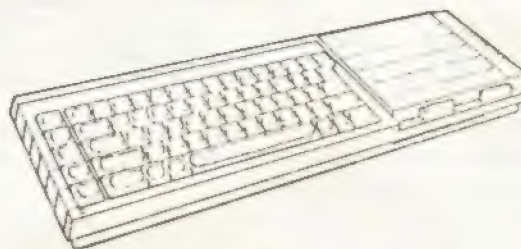
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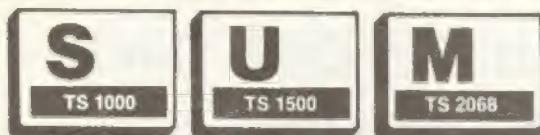
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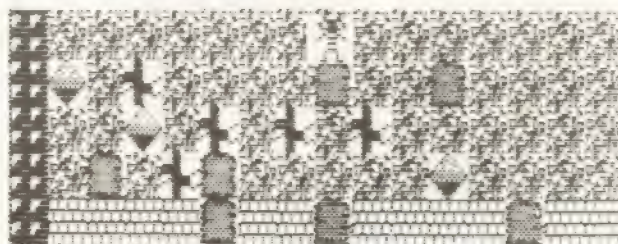
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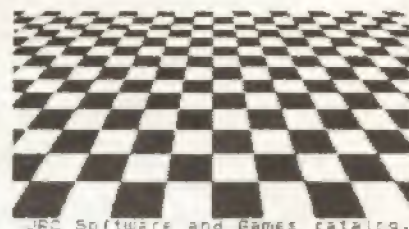
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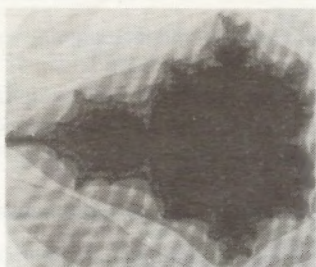
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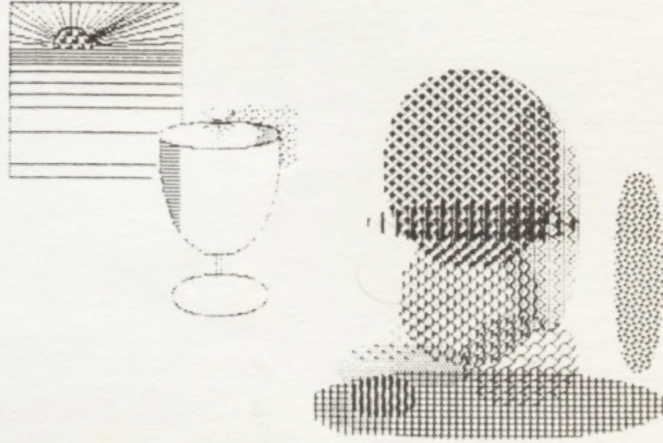
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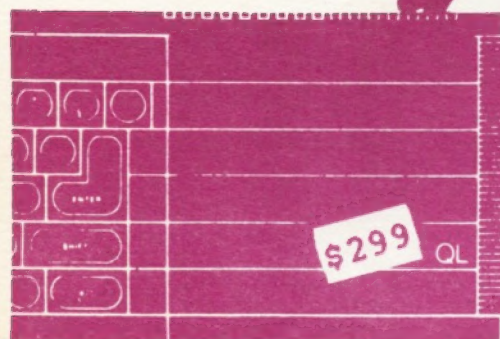
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